

Troubleshooting Behavioral Interventions:
A Systematic Process for Finding and Eliminating Problems

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Abstract

This paper describes a systematic process for finding and resolving problems with classroom based behavioral interventions in schools. Described is a step-by-step process for examining issues which may be contributing to a lack of intervention effectiveness. The paper is organized around the Behavioral Intervention Troubleshooter which is a checklist focusing on three major domains: (a) fundamentals of classroom instruction and behavior management, (b) intervention integrity, and (c) intervention design. For each of these three sections, we describe probable outcomes derived from use of the checklist. For each outcome, suggestions are provided for elimination or resolution of the problem so as to increase intervention effectiveness. Finally, each section concludes with a brief literature review describing the evidence base for the recommended practices.

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Behavior is a function of the person interacting with the environment. From this basic premise it follows that behavior problems in classrooms reflect environmental arrangements and must be remedied through changes in how the child interacts with teaching and instruction. It is difficult to consider child behavior, regardless of its form, as “wrong” in response to teaching and instruction. Instead, the behavior is a tool the child uses to communicate, to obtain things, to get out of things, and so on. Every child, at any given moment, is continually making the decision of what to do next. The goal of intervention, from the school’s perspective, is to assist the child to choose activities that are more often consonant with the goals of schooling.

There is nothing that is routine, common, or simple about the design and use of interventions for behavior problems in schools. Instead, teachers and consultants face a morass of some of the most difficult problems to resolve in one of the most complex of all situations, the school. A clever child has an arsenal of possibilities to keep the most sophisticated of us busy. In fact, the most challenging cases defy the limited linear world of the “problem solver” because the child has almost total freedom to change behaviors, to change what the behaviors gain (e.g., attention, escape, tangibles), to change the behavior of classroom peers, to change locations of the behavior, to conceal behaviors, and to rest behaviors and then restart them. Further, children are able to devote their full time and creative energies to these endeavors whereas teachers are continually “distracted” from behavior management because of their instructional duties and the presence of other children.

Most school psychologists, confronted with a referral for a behavior concern, approach the case with trepidation, knowing full well from experience the thorny and difficult possibilities. It would be one thing to attempt to analyze and resolve the problems deep inside the highly controlled walls of an in-patient facility. That is difficult enough. However, we must work in the school setting where perfect control cannot be obtained. Hence, preferred practice of changing one and only one variable and observing its effect is more difficult because multiple variables may be beyond our capacity to control and are constantly changing.

The purpose of this paper is to describe a systematic approach to troubleshooting behavioral interventions that are not working. Recognizing that there are some things over which the school-based interventionist does and does not have control, the focus of the paper is to insure that the fundamental aspects of instruction, classroom management, and intervention design are intact. As an organizing heuristic, Figure 1 presents the Behavior Management Pyramid proposed by Witt, VanDerHeyden, & Gilbertson (in press). The framework is linear in that it is recommended that lower levels of the pyramid (e.g., basic instruction, proactive behavior management) occur first, recognizing that attempting to manage the behavior of a student who cannot perform his/her main job (i.e., school work) or who is in a disorderly, chaotic environment is futile. (See Figure 2). Hence, first things first: If a behavior problem is noted in a classroom, then first the quality of classroom instruction and proactive classwide behavior management should be checked and repaired if needed. Here, students must have work they can perform and there should be a system in place for first preventing and then responding to common behavior problems. Once these basic foundational layers are intact, then individual intervention may be attempted. If the problem persists following implementation of an intervention, then treatment integrity should be assessed prior to changing the intervention.

Logically, there are two primary reasons that interventions fail: the intervention design is flawed (i.e., not the right intervention) and/or the intervention was not correctly implemented.

This linear approach is designed to systematically “cover all the bases” by ruling out factors that may reduce intervention effectiveness. A *Behavioral Intervention Troubleshooter* checklist is provided in Figure 3. As can be seen, the final area described in the *Behavioral Intervention Troubleshooter* checklist is the intervention itself. Whereas school-based teams may be quick to identify the intervention as the most likely reason for intervention failure, it is impossible to determine intervention effectiveness if certain elements have not occurred (e.g., it is impossible to determine if the intervention is ineffective if the intervention is not used). The linear sequence is designed to help a consultant insure that intervention is installed on top of solid classroom fundamentals. When we are presented with a request to respond to a child with a behavioral concern, it is natural for us to begin by analyzing the referred child’s behavior. However, the problem presented to us (i.e., the child) may not be the issue to be addressed first. Instead, the child’s behavior may actually be an understandable response to the situation and an exclusive focus on the child’s behavior may lead to an iterative process where there is a repeated need to resolve similar problems, in slightly different forms, with the same child. This “fix first things first” is also compatible with the triage mindset of the physician. If an individual comes into an emergency room having had a car accident, and this individual has a broken pelvis (which is a life-threatening injury), then we know immediately that an orthopedic surgeon will be needed to repair that problem. At the same time, if the individual is not breathing, then we must first establish breathing prior to sending this individual off for repair of a broken pelvis. That is, breathing is so important, that it must come first to set the proper foundation for subsequent repairs to broken bones. Similarly, behavioral interventions must identify the right

priority (i.e., classroom instruction) attend to multiple variables and indicators of positive outcomes (e.g., increasing adaptive behaviors, decreasing problem behaviors) but do so in a manner which is efficient and reasonable for school-based professionals. In summary, the goal is to increase the chances that an interventionist has sufficient environmental control to make an intervention work by incorporating an intervention within a generally well-managed classroom where students are successfully learning and teachers are supported.

Behavioral Intervention Troubleshooter

Figure 3 shows the *Behavioral Intervention Troubleshooter* (BIT) checklist. This checklist serves, within the current context, as a compendium of activities to be applied sequentially in problem-solving surrounding a behavioral intervention. The organization of the BIT checklist is sequential and parallels the Pyramid in Figure 1. Checks in the “NO” column indicate a potential problem that should be investigated further.

The structure of this paper is organized around the major sections of the checklist. In each section, we describe probable outcomes derived from use of the checklist. For each outcome, suggestions are provided for elimination or resolution of the problem. Finally, each section concludes with a brief literature review describing the evidence base for the recommended practices.

Prior to Using the Troubleshooter's Checklist

Use of the troubleshooter assumes that the intervention is potentially fixable and that there is sufficient documentation about the intervention to make decisions. Specifically, it is difficult to know if you can repair an intervention when:

- ? No documentation exists that a systematic process was used to define problem behavior.

- ? No progress monitoring data are currently being kept on student behavior
- ? No behavioral goals were set and documented by which to mark progress.

Therefore, as an initial step, a consultant should evaluate whether troubleshooting is needed or whether something more radical might be needed.. Troubleshooting, as we will use the term here, is a process of finding and eliminating problems. Troubleshooting implies that the goal is to work within the framework of an *existing* intervention that is already underway and find out what is wrong and what will make it work.

The most common alternative approach to troubleshooting is to simply start over with the intervention. Starting over is necessary if the intervention currently in place was not conceptualized and used in a manner that is approximately correct. When fundamental components of problem solving have not occurred, the intervention may be fatally flawed. For example, incorrect problem definitions and absence of ongoing progress monitoring data on intervention effectiveness constitute fatal flaws. Without these basic components it is impossible for troubleshooting to occur. How would you know what might be wrong with an intervention if you do not know what the intervention is supposed to accomplish or if you have no data on whether the intervention is effective?

Every intervention should have a well-defined problem that is the focus, baseline assessments of the problem should have been conducted, quantifiable goals for knowing when success has been obtained should be clearly stated, and importantly, a way of measuring progress toward the goal must be present. If one or more of these basic intervention components is absent, this is potentially a fatal flaw that could lead to beginning with the basics by defining a problem, assessing the context, etc. Assuming that intervention fundamentals are in place, the

BIT can be used. Each of the following sections corresponds to a major section of the BIT (Figure 3).

Check for Problems with Classroom Fundamentals

Telltale Signs that this Issue May Be in Play

Typically once a behavior concern is brought to the attention of a consultant, the behavior has reached a serious level such that the student may be interfering with instruction in the classroom and the teacher is likely frustrated, the parents have often been made aware of the problem through attempts to “treat” the problem (e.g., suspension, referrals to the office), and the child is likely well-known to the school’s authorities. The reactive nature of this timeframe places those who wish to resolve the problem at a disadvantage because misguided treatment efforts may very well have contributed to the problem (e.g., allowing escape from instruction), making the problem more difficult to resolve and causing those who must change their behavior to be less willing to allocate efforts toward resolution. Perhaps most critically, a singular focus on a particular child initiates a sequence of events that often leads to removal and placement of an individual child without adequate attempts to effectively resolve the problem in the classroom. Further, this approach often results in additional referrals from the teacher because *the teacher’s behavior may remain unchanged.*

Where fundamental classroom management procedures are not intact, learning suffers. Hence, when a referral for troubleshooting is received, the first order of business should be checking the adequacy of the classroom instructional environment. The assessment questions focus on whether this is a classroom that promotes academic success for *most* children and whether *most* children are behaving appropriately. If basic procedures that promote learning and behaving are not intact, then it is very, very difficult to assist the teacher with one child. When a

brief observation indicates a problem in any of the intervention components within Level 1 in Figure 1, efforts should be aimed at improving whole-class management prior to singling out an individual child for individual functional assessment. In particular, the following are particularly important cues to the troubleshooter that classroom fundamentals may be at issue:

- ? During observation, randomly selected children in the classroom exhibit off-task behavior greater than 30% during instructional or non-instructional periods (Walker & Severson, 1990).
- ? Class median performance on grade-level academic skills, as determined by universal screening (VanDerHeyden, Witt, & Naquin, 2001; Witt, Daly, & Noell, 2000) falls below a minimum instructional standard (Gickling & Armstrong, 1978; McDowell & Keenan, 2001).
- ? Transition times between and within activities are greater than 4 minutes (Emmer, 2001).

Assessing and Responding to This Issue

Assessment Outcome A

Quantitative data indicate average class on-task behavior is less than 70% during an observation session and/or median performance on grade-level academic tasks fall below an instructional range.

Next step. Because working correctly on an academic task and off-task behavior are incompatible responses, performance on an academic task is a logical replacement behavior for disruption in the classroom. It is also a goal that has much social value if the assumption is made that the primary “job” of children in school is to learn.

If class median performance on a grade-level academic skill falls below a minimum instructional standard, then the work may be too difficult for the average child, creating opportunities for off-task behavior. Indicators of weak performance and high off-task behavior lead the consultant directly to a series of intervention activities that will effectively rule out weak classroom instructional procedures as the cause of child disruption prior to proceeding with subsequent assessment. To ensure that the work assigned represents an instructional-level task the psychologist and teacher may have to look at the curriculum objectives, measure child performance directly, and determine effective instructional strategies that can be applied to instructional level material to promote growth. It is a common error *not* to check instruction as a first step in behavior management. The rationale is that it is unfair and unproductive to ask children to do work that they are not capable of doing. The consultant can assist the teacher to sample back to less difficult skill levels and map out a plan to increase difficulty as skill level improves. The consultant should observe to see that the teacher gives clear directions (with examples of correct responding and incorrect responding) during instruction and provides active monitoring during the task. The consultant should observe to ensure that the teacher has a system for monitoring correct work completion and providing consequences for correct and incorrect completion as children perform the assigned task.

Alternatively, if children are performing academic work as expected, then on-task behavior should be increased. This can be accomplished using a number of classwide management systems including praise, group contingencies, and token economies.

Assessment Outcome B

Quantitative data indicate that transition times between activities in the classroom are greater than 4 minutes.

Next step. Another key indicator of a classwide management problem is transition times that are too long (Cotton, 1995). Transitions are considered a keystone because they occur many times per day and they provide a clear indication during observation of whether, in general, routines and procedures are actively utilized. Transition times that are too long offer children an opportunity to find ways to occupy their time and often the activity chosen is disruptive or interferes with learning. Also, long transition times diminish academic engaged time. In this case, the consultant should assist the teacher to implement a transition routine (LaFleur et. al., 1998). The transition routine should include use of adequate instructions prior to initiating the transition and a clear start and stop cue. The children should be explicitly taught what behaviors are expected during the transition and be provided an opportunity to practice with feedback daily routines (e.g., lining up, bathroom procedures, early finisher routine). Future practice can be made contingent on noncompliance with the routine and can be scheduled during times that are highly prized by students (e.g., recess).

Assessment Outcome C

Quantitative data indicate that problematic behaviors occur for many children during non-instructional periods outside the classroom (e.g., office referrals, lunch period, playground).

Next step. In this case, the first step should be to increase active monitoring or supervision during the activities during which the behavior occurs. Training can be provided to actively walk around problem areas, increase positive contacts with students, scan for student rule violations, and apply brief time-outs when violations occur. Colvin, Sugai, Good, & Lee (1997) found that these procedures increased supervising behaviors which resulted in decreased rule violations without additional adult supervision.

Evidence-Based Principles

Principle 1: Use of Antecedent Strategies Improves Learning

Alarming, children with challenging behaviors may receive less instruction and less effective instruction relative to same-age peers (Carr, Taylor, & Robinson, 1991; Gunter & Denny, 1996) although they often have weaker academic skills relative to their peers (Sutherland & Wehby, 2001). Disruptive behaviors, missed instruction, poor achievement, school failure, placement in special education, and increased risk of drop-out are co-occurring phenomena (Kortering & Blackorby, 1992; Walker, Shinn, O'Neill, & Ramsey, 1987; Walker, Steiber, & O'Neill, 1990). These findings are critical because they highlight an interactive pattern that may contribute to the shaping of poor academic performance in students. Effective teachers maximize academic engaged time resulting in greater academic achievement among their students (Gettinger & Stoiber, 1999; Greenwood, 1996). Academic engaged time reflects opportunities to respond (McKee & Witt, 1990). Opportunities to respond positively affect achievement because students who frequently practice learned skills are better able to integrate and organize information more quickly and accurately and apply these skills in the completion of increasingly complex tasks (Binder, 1996; Skinner, Fletcher, & Henington, 1996). Several variables have been found to increase opportunities to respond and effective teachers use these strategies. For example, use of briskly paced guided practice, choral responding, and response cards (Munk & Repp, 1994); intermixing easier (Skinner, Hurst, Teeple, & Meadow, 2002) or more preferred problems (Noell, Whitmarsh, VanDerHeyden, & Gatti, 2002) with more difficult or less preferred items within a task; varying reinforcement for correct performance (Dunlap & Koegel, 1980); modifying task effort (Kern, Choutka, & Sokol, 2002); giving students choices (Dunlap, et al., 1994); and embedding low-probability with high-probability tasks (Belfiore, Lee, Vargas,

& Skinner, 1997) have all been shown to increase on-task behavior and correct work completion. Immediate corrective feedback (Waxman & Walberg, 1991); use of a high positive-to-negative comment ratio (Shores & Wehby, 1999); and use of goal setting and feedback (Martens, Hiralall, & Bradley, 1997) have been shown to improve academic work performance. Placing the contingency on academic work performance has been found to produce corresponding decreases in problem behavior without having to specifically target off-task behavior (Noell, VanDerHeyden, Whitmarsh, & Gatti, 2001).

Principle 2: Managing Antecedent Conditions is More Effective than Using Consequences for Behavior

Effective and ineffective teachers do not differ in how they deliver consequences for undesirable behaviors. Rather, they differ in their use of antecedent strategies to prevent the occurrence of problem behaviors in the first place (McKee & Witt, 1990).

For example, consistent use of routines to organize non-instructional classroom activities that must occur but do not directly facilitate learning has been shown to increase academic engaged time and improve learning (McKee & Witt, 1990). Teachers who use routines for turning in and checking homework, collecting lunch money, taking attendance, turning in completed work, and other daily chores increase the time allocated to the primary objective—instruction—and enhance learning. Further, teachers who have a system for handling instruction in their classes can better match instructional activity to skill level (e.g., introduce new skill, provide paired practice with frequent immediate feedback, and so on) and thus, manage to embed a greater number of opportunities to respond or complete learning trials in the day. Effective management of transitions during the school day can maximize academic engaged time and prevent disruptive behavior (Cotton, 1995). A simple transition routine in which the teacher

provides clear directions, a salient start and stop cue, and uses active supervision during the transition with consequences for quick completion of the transition has been shown to reduce time devoted to moving between activities (LaFleur et al., 1998).

Effective teachers have a system for managing rules. Lack of rule clarity, absence of consistent consequences for rule violations, and ineffective instructional practices in schools are related to aggressive and noncompliant child behaviors (Mayer, 1995; Walker, Colvin, & Ramsey, 1994). Simply posting rules is insufficient. Effective teachers ensure that children understand how to comply with the rules, provide explicit examples of compliance and rule violation, and finally, provide consistent consequences for compliance and noncompliance with classroom rules (Emmer, 2001). A system for managing classroom routines and rules allows the teacher to maintain a focus on the primary job of academic instruction while rules and routines organize non-instructional classroom activity.

Principle 3: Job-Integrated Professional Development for Teachers is both More Feasible and More Effective to assist Teachers to Have the Skills Necessary for Effective Classroom Management

Multiple studies have demonstrated that verbally describing intervention techniques is insufficient to establish the skills necessary for competent adaptation and application in the classroom (Reid & Parsons, 2000). Rather, direct training to a criterion level of performance is necessary to establish the behavior for the teacher and produce corresponding gains in child performance (Carnine & Fink, 1978; Reid & Parsons, 2000). Effective training for teachers including verbal and written instructions, rehearsal, and finally performance-based training or coaching, is not consistently available to all teachers, especially since trainers require both competence in performing the techniques being trained as well as competence in consulting and

training teachers to implement the techniques (McGimsey, Greene, & Lutzker, 1995). It is no wonder then that adequate preparation is a continuing concern in teacher training and that teachers leave the field at such high rates, particularly within the first two years (U.S. Department of Education, 2003). Teachers who rely on ineffective or weak interventions such as discussion, redirection, and preferential seating, and have no ready access to effective resources are perhaps even more likely to leave teaching altogether. Hence, a broader system of supports appears to be needed to facilitate the development of sustainable competence in instructional and behavioral management in the classroom (Atkins, Graczyk, Frazier, & Abdul-Adil, 2003). Teachers need to be equipped and supported in their roles in shaping behaviors in the classroom.

Principle 4: Children Require Training and Practice in Expected Behavior Performance in School.

An observation will reveal whether or not children know what behaviors are expected and how to perform them. When many children appear to be off-task or exhibiting behaviors that interfere with learning, whole-class instruction in behavioral expectations is needed. Adults often assume that children know how to perform the behaviors that are expected of them in schools. Yet, data indicate that proactively teaching children to perform prosocial behaviors, actively monitoring to ensure that correct behavior performance is exhibited, and providing consequences for correct and incorrect performance is necessary to establish desired prosocial behaviors in schools (Colvin, Sugai, Good, & Lee, 1997; Mayer, 1995; Walker, Stiller, Severson, Feil, & Golly, 1998).

Principle 5: Children need “a reason” to behave as expected. One of the underlying premises of this paper is that monitoring and consequences are necessary to establish and maintain desired responding (e.g., academic productivity and compliance) in the classroom.

Behaviors that are reinforced will persist. Behaviors that are not noticed or punished will diminish. Some of the numerous behavioral strategies that apply these principles have effectively changed behavior in the classroom including praise, group contingencies (Gresham & Gresham, 1982), overcorrection (Carey & Bucher, 1983), response cost (Kelley, & McCain, 1995), and token economies (Musser, Bray, Kehle, & Jenson, 2001).

Check for Problems with Intervention Integrity

Telltale Signs that this Issue May Be in Play

The following types of information may suggest problems in the area of intervention integrity.

- ? Lack of data on implementation.
- ? Lack of progress monitoring data on intervention outcomes.
- ? Absence of permanent product evidence.
- ? When interviewed, student cannot accurately describe intervention.
- ? When interviewed, interventionist cannot accurately describe intervention.

Assessing and Responding to this Issue.

Assessment of intervention integrity, as indicated in the checklist, ordinarily involves a review of data on implementation. This assessment may reveal that integrity data are not present or that the plan is not being reliably implemented. The following assessment outcomes are likely. For each outcome, recommendations are provided for “next steps” that may help solve the problem.

Assessment Outcome A

Quantitative data on intervention implementation exists and indicates no integrity issues.

Next step. If this is true, then the consultant should check intervention design and consider changing the intervention because if intervention outcomes are poor, then a different intervention may be justified given that it appears the present intervention is being implemented with integrity.

Assessment Outcome B

Quantitative data on intervention implementation exist and indicate that the intervention has never been implemented with integrity but there is evidence of a lack of training and follow-up support for the interventionist.

Next step. The consultant should check training and support provided to interventionist and complete the following activities.

- ✍ Insure that interventionist is committed to implementing the intervention.
- ✍ Insure that interventionist has all needed materials. It is important that step-by-step procedures (i.e., a coach card) be provided in writing.
- ✍ Use a Tell-Show-Do Approach to assist interventionist in being able to conduct the intervention.
 - ? Tell—Explain the intervention and tell why each component is needed.
 - ? Show—Model the procedures for the interventionist.
 - ? Do—Have the interventionist proceed through each step of the intervention (with the child). Provide prompting, feedback, and support as needed.
 - ? Consider the interventionist adequately trained when each of the steps are performed without trainer prompting or assistance.
- ✍ Provide follow-up support and contact information should questions arise.

Assessment Outcome C

Quantitative data on intervention implementation exist and indicate that the intervention has never been implemented with integrity despite strong support and follow-up being provided by the consultant.

Next step . Getting an intervention conducted properly in busy schools is difficult. For teachers especially, there are many things that *must* get done. The routine use of basic performance management procedures will be helpful in increasing the use of interventions. At a minimum, the consultant should complete the following activities.

- ✍ Obtain a commitment from the interventionist prior to beginning the intervention. At a minimum ask, “Is this something you feel you can do?”
- ✍ Build in weekly team reviews of the intervention where data pertaining to student outcomes and implementation are reviewed.

More systematic performance management procedures can be used if needed (see for example, Witt, Noell, LaFleur, & Mortenson, 1997). Intervention progress can be presented to the teacher in a supportive manner by reviewing graphs of student behavior and intervention implementation, providing positive feedback regarding steps that were completed and identifying treatment steps that were omitted or implemented incorrectly and problem solving for future implementation.

Assessment Outcome D

Quantitative data on intervention implementation do not exist.

Next step . The consultant should begin the collection of permanent product data on implementation.

- ✍ Select or design interventions that yield permanent products (i.e., byproducts of the intervention that occur when the intervention is used and thus, are evidence that the intervention has been conducted).
- ? For example, if a child is given a star for meeting his goal of less than 3 out of seat behaviors, the star chart is a permanent product. The teacher record sheet or self-monitoring sheet would be a second permanent product.
- ? Behavior problems (excesses or deficits) often do not yield a permanent product as the behavior occurs. For example, talking with peers does not produce a permanent record. However, academic performance should be given strong consideration as the replacement behavior in many plans to decrease inappropriate behavior and academic work has the additional advantage of automatically producing permanent products (e.g., scored worksheets).
- ✍ Routinely graph permanent product data.

Evidence-Based Principles

Principle 1: Quantitative Data are More Useful than Self Report of the Interventionist

Accurate decision-making depends on the quality of the assessment data used to make decisions. Frequently, the degree of intervention use and the change or lack-of change in child behavior is obtained from teacher self-report measures. However, a poor correlation between teacher self report on intervention usage and direct observation obtained in several studies suggests that *self-report measures overestimate actual treatment integrity* (Sterling, Turner, Watson, & Moore, 2002). For example, Robbins and Gutkin (1994) found that teachers who agreed to increase positive verbal statements reported that they implemented the intervention as planned. However, classroom observations indicated a decrease in positive statements for two

teachers and only moderate increase for a third teacher. Similarly, Wickstrom, Witt, Jones, and LaFleur (1998) found that classroom observations indicated that teachers implemented behavioral interventions with than 10% integrity although teachers reported high intervention use. Because self-report is an unreliable measure, direct assessment measures of the teacher's use of the intervention (observations, videotapes, permanent products) more accurately determine when a child's lack of change is due to lack of intervention use (Witt, Gresham, & Noell, 1996).

Principle 2: Directly Teaching and Supporting New Intervention Skills in the Classroom Setting is a Necessary Condition to Promote Treatment Integrity

Given demands on a busy interventionist (usually a teacher), a lack of support for conducting an intervention, and the "prize" at the end of keeping a disruptive student in class (rather than referral to another setting), lack of treatment integrity is a perfectly understandable response. Hypothetically, a wide range of issues such as having access to intervention materials as well as knowledge and skills of intervention specifics may impede implementation behaviors in the natural setting (Austin, Carr, & Agnew, 1999). Adequate intervention planning and direct training prevent many of these issues. For example, Erhardt, Barnett, Lentz, Stollar, & Reiffen (1996) effectively used scripted instructions to increase teachers' engagement in intervention activities. However, Sterling, Turner, Watson, & Moore (2002) found that direct teacher training consisting of classroom rehearsal and feedback rather than indirect verbal and scripted instructional training resulted in greater gains in treatment integrity. Similarly, LaFleur et al. (1998) provided in-class training sessions using a "bug-in-the-ear" approach to prompt the implementation of an intervention in the classroom setting but found that follow-up with delayed feedback given after the teacher independently used the interventions maintained accurate treatment use over time. By including training within the classroom environment, interference of

environmental factors with proper implementation of the intervention can be identified and resolved.

Principle 3: Use of Visual Graphic Displays for Reviewing Integrity Data is More Effective

A critical component that significantly improves performance is the inclusion of a systematic ongoing evaluation of a program (Fuchs & Fuchs, 1986). Moreover, the addition of graphical information has more consistently changed work performance and treatment integrity than using written or verbal feedback alone in studies conducted in applied organization settings and more recently in educational settings (Alvero, Bucklin, & Austin, 2001). For example, Noell et al. (2000) investigated the effects of a brief daily meeting on intervention use when consultants simply asked the teacher how the intervention was progressing. Teacher intervention implementation increased moderately with brief verbal consultant meetings for 40% of participating teachers, whereas implementation increased after given daily feedback with graphical information on intervention use and child progress for the remaining 60% of teachers. Noell et.al. (in submission) conducted a more extensive randomized field trial that applied one of three follow-up procedures when integrity declined. The three follow-up procedures used in this study were performance feedback with graphic displays, brief weekly interviews discussing treatment and student progress, and a social influence procedure that discussed treatment and student progress with an emphasis on the importance of committing to implement an intervention for the child and ways to support implementation. Results indicated that the performance feedback procedure was associated with large increases in accurate intervention usage whereas the weekly interview and the discussions emphasizing treatment commitment were not. Importantly, high intervention usage sustained as daily performance feedback was faded to every other day and then to weekly.

Principle 4: If Treatment Integrity is Inadequate After Direct Training, Performance Feedback Works.

Performance feedback is a method that provides trainees with direct information regarding the accuracy of their performance in the appropriate setting in order to enhance and maintain proper behavior change (Alvero, Bucklin, & Austin, 2001). Recent studies have demonstrated the powerful influence of performance feedback on teachers' implementation of intervention when accurate treatment implementation declines after training (Noell, et al., in submission). Specifically, performance feedback used daily (Witt, Noell, LaFleur, & Mortenson, 1997), weekly (Mortenson & Witt, 1998), and with brief feedback notes (Martens, et al., 1997) effectively increased treatment integrity to levels that led to increases in student academic and behavioral performance. In each of these studies, treatment integrity levels generally decreased as teachers independently implemented academic or behavioral interventions after having been trained to a fluency criterion in the classroom setting. When integrity declined, a follow-up condition was introduced providing teachers with positive verbal feedback, a discussion of student progress and missed steps, goal setting, and graphic displays of student behavior and intervention implementation. Generally, intervention usage increased with performance feedback and produced corresponding improvement in student performance. For more resistant cases in this series of studies, the addition of administration support (i.e., providing data to the administrator and the teacher) promoted the effectiveness of performance feedback similar to findings in the applied organizational literature (Alvero, Bucklin, & Austin, 2001; Noell et. al., 2000).

Check for Problems with Intervention Design

Up to this point in the troubleshooting process, the consultant has ruled out most of the “usual suspects” likely to impede intervention effectiveness, except the intervention itself. That is, each of the foundational layers in the pyramid model in Figure 1 is present and appropriate. Therefore, it is known that at this third or highest level, the assessment data have indicated that the academic program is appropriate for the target student, that a generally effective classroom management plan is in place and effective for most other students, and that the intervention is being implemented correctly for a suitably defined problem. Despite these conditions, the intervention that targeted an individual behavior management problem did not work. At this level, the goal is to focus on the intervention to determine why it is not producing the desired outcomes and to then modify or redesign the intervention.

Telltale Signs that this Issue May Be in Play

The following types of information may suggest problems in the area of intervention design.

- ? The student has obtained little reinforcement when using the appropriate behavior that replaces the inappropriate behaviors.
- ? Problem behavior remains effective and functional for the child
- ? Replacement behavior is used and effective but in few settings or with few people.
- ? Intervention was initially effective but effectiveness has not endured or has diminished over time.

Assessing and Responding to this Issue

If all preceding levels have been adequately addressed in the pyramid, then an intervention data system designed to measure change in the problem behavior and a replacement behavior should indicate whether or not the frequency of these two behaviors changed when the

intervention was implemented. Below are some common assessment outcomes and their interpretation.

Assessment Outcome A

Quantitative data indicate problem behavior frequently occurs and replacement behavior seldom occurs.

Next step. The first priority is to determine if a functional assessment has been conducted to ascertain why the problem behavior is occurring. After identifying antecedents and consequences in relevant settings through a functional assessment process, antecedents that are “triggering” problem behaviors may be changed or eliminated. Alternatively, the student can be taught to use a replacement behavior in the presence of these antecedents. Next, the interventionist can be trained to block the consequence (extinction) or weaken the reinforcement schedule maintaining the problem behavior. Finally, existing contingencies can be reallocated so that the replacement behavior leads to the same consequence that was maintaining the problem behavior (differential reinforcement of other or alternative behavior).

A second priority is to determine if low levels of the replacement behavior are due to inadequate training. If the replacement behavior is not used or is used in few situations, the consultant should retrain the student by providing instruction, modeling, rehearsal, and feedback using multiple situations and salient elements common to the environment that signal proper use of the replacement behavior. If the replacement behavior is not easy for the student to do during training, then response effort may be decreased. To promote use in the natural environment, the consultant can include prompts and immediate feedback as part of the intervention plan that can be faded as the student learns to use the behavior fluently. Finally, the intervention should

provide frequent opportunities that allow the student to practice the skill in various situations with immediate positive or corrective feedback.

The third priority is to determine if the reinforcement conditions (frequency, immediacy, and duration) obtained with the use of the replacement behavior are lower than the reinforcement conditions obtained with the use of the problem behavior. In this case, there may not be adequate environmental support to motivate the child to perform the behaviors. For example, a history of inappropriate behavior excesses may have resulted in peer and adult avoidance that continues when the student attempts to use prosocial behaviors. Employing peer confederates, for example, can provide social reinforcement (Brown & Odom, 1994). If the student needs to obtain a goal in order to obtain reinforcement, such as in a token system, then the consultant can simply lower the goal to make it easier for the student to gain the preferred consequence. Moreover, the intervention can be initially implemented in situations in which the child would be likely to obtain consistent reinforcement until the contingency between the replacement behavior and preferred consequence is established. The final consideration is to ensure that the problem behavior no longer produces the outcome that the student finds reinforcing as a replacement behavior successfully obtains the same reinforcement that is withdrawn.

Assessment Outcome B

Quantitative data indicate problem behavior frequently occurs and replacement behavior frequently occurs.

Next step. This data pattern indicates that the student has successfully learned to use the replacement behavior and the behavior is reinforced. However, problem behaviors will continue to occur if they also continue to be reinforced. Although completely withdrawing reinforcement for the problem behavior is the ideal intervention solution, it is often difficult to control all

sources of reinforcement in the environment or to withdraw reinforcement at all times.

Alternatively, new reinforcement contingencies that support the problem behavior may develop after identification of the original function of the behavior. For both instances, applying a mild punishment component such as reprimands, overcorrection, or response cost decreases problem behavior.

Assessment Outcome C

Quantitative data indicate both problem behavior and replacement behavior seldom occur.

Next step. The intervention effectively decreased the problem behavior, but in this case, a well-behaved student may not exhibit adequate behaviors that maintain academic progress or positive social interactions. Progress monitoring of academic performance and social interactions indicate that re-training of the replacement behavior, reconsideration of the replacement behavior selection, or additional environmental support is required to ensure enough opportunities to earn reinforcement.

Assessment Outcome D

Quantitative data indicate an intervention that was originally effective has decreased in effectiveness.

Next step. This common outcome can often be explained by matching and/or diminished integrity or an interaction between the two. Behaviors that are extinguished or suppressed will occasionally re-emerge, particularly if integrity is less than 100%. After determining that the intervention was used as planned with integrity, the approach that should be used in response to this outcome is to investigate whether or not the child is earning reinforcement for responses other than academic work productivity in ways that are faster, more immediate, less costly, and

of higher quality. If so, then these sources of reinforcement must also be blocked for disruption to remain at low levels. In general, even given an excellent functional assessment, teachers must be taught to minimize suspected sources of reinforcement for disruption and maximize potential sources of reinforcement for academic responding for intervention effects to endure. Further, an individual will continue to sample all available reinforcers at a rate governed by particular parameters (e.g., rate of reinforcement, immediacy of reinforcement, response effort, quality of reinforcement, available reinforcement in the setting). Take for example, the child who is willing to complete math problems at a high rate and high accuracy to earn some edible reinforcer. This child's math performance is likely to persist so long as there is not much available reinforcement for other responses (e.g., throwing a paper airplane at one's buddy across the room when the teacher is not looking), the edibles are granted immediately, are highly preferred, the task represents an instructional level skill for the child, and reinforcement is provided on a dense schedule. If reinforcement is available for other responses, then so long as the scale is tipped in favor of math performance (i.e., faster, better, more reinforcement) it will occur at higher rates than other responses, but other responses will continue to occur at a rate roughly equivalent to how much they are reinforced.

Evidence-Based Principles

Principle 1: Interventions Are More Effective if the Features in the Environment that Reinforce the Problem Behavior are Identified and Manipulated

When a child has not adequately responded to the lower-tier efforts at promoting positive classroom behavior and individual child behavior must be addressed, functional assessment is superior to topography-based treatments. Hundreds of functional analyses have been reported in the literature (Asmus, Vollmer, & Borrero, 2002). Functional analysis data link directly to

treatment by identifying potential predictor or maintaining variables that can be manipulated to alter the response-reinforcer relationship. Because no specific form of treatment has been shown to be sufficiently effective across behavioral topographies, contingencies, and situations, function-specific treatments are superior in reducing problematic behaviors and increasing appropriate behaviors (Iwata, Vollmer, Zarcone, & Rodgers, 1993). Functional analysis involves exposing an individual to several conditions in which specific environmental variables are directly manipulated to determine their effect on the target behavior. An elevated rate of behavior in a given condition suggests that the target behavior is maintained by the contingencies in effect for that condition. Because of the promising effects of functional analysis procedures with persons with developmental disabilities, school-based researchers and practitioners have adopted and expanded the methods for use in classroom settings with typically-developing children (Broussard & Northup, 1995; Sasso, et al., 1992; Noell, et al., 2001; Taylor & Romanczyk, 1994) and children with diagnoses such as Attention Deficit Hyperactivity Disorder (Gulley & Northup, 1997). Given that children exhibiting noncompliance, disruption, and aggression (Nelson, Rutherford, Center, & Walker, 1991) are likely to be exposed to generally ineffective treatments such as discussion, repeating, and removal that are then replaced with increasingly restrictive and ineffective treatments such as placement in special education (Walker, Colvin, & Ramsey, 1994), proactive identification and systematic intervention progressing from less intensive to more intensive with ongoing data to indicate effectiveness is particularly important for this group of children (Sugai, 2003).

Principle 2: It is Both Ineffective and Inappropriate to Merely Reduce Problem Behavior and Replacement Behaviors Must be Identifiable for all Reductive Interventions

Consequence based reductive strategies utilizing punitive approaches are frequently the first intervention employed by teachers (Dunlap, & Kern 1993). However, several limitations are associated with on the exclusive use of reductive procedures (Dunlap, Kern, & Worcester, 2001). First, punitive strategies include suspension, expulsion, or placement into a more restrictive classroom that may be contrary to legal requirements mandating least restrictive educational placement. Second, punishment is sometimes associated with negative side effects (Lentz, 1988) such as avoiding the person who doles out the punishment. Third, consequential strategies designed to decrease inappropriate behavior may not increase preferred behaviors. If students use problematic behaviors to serve a communicative function, then reduction of these behaviors requires a more adaptive replacement behavior to help the child meet his or her needs in everyday environments. For example, Durand and Carr (1992) compared the effectiveness of two interventions for attention-maintained problem behavior exhibited by two groups of children. Training a more appropriate behavior to replace challenging behaviors was implemented with the first group of children whereas time-out from teacher attention was implemented with the second group. The authors observed reductions in problem behaviors with both interventions in the presence of a trained teacher. Alternatively, in the presence of untrained teachers, only the students taught to use appropriate behaviors demonstrated low levels of problem behavior *and* appropriate requests for attention that were reliably followed by teacher attention.

An alternative reductive intervention is to withhold the reinforcing consequence (i.e., extinction) when the problem behavior occurs; however, there are several disadvantages with the exclusive use of this strategy. For example, problem behaviors may increase in frequency and magnitude or different types of problem behaviors may emerge as a student makes great effort to produce the reinforcing consequence (Lerman & Iwata, 1995). Further, occasional lapses in

treatment integrity or intermittent reinforcement make the behavior more resistant to extinction as students learn that consequences occur after longer durations or more intense behaviors (Asmus, Vollmer, & Borrero, 2001). Teaching and taking steps to ensure that an adaptive behavior produces the desired consequence quickly and easily can ameliorate problems associated with extinction (Lerman & Iwata, 1995). For some individuals who exhibit severe and potentially damaging behaviors, the addition of mild forms of negative consequences or the use of extinction is often required for successful replacement behavior training (Mazaleski, et al., 1993; Wacker, et al., 1990) but may be faded once the replacement behavior is well-established. Wacker et.al. (1990) found that aggressive behaviors decreased after learning to use a communicative response that produced desired consequences only when time out or graduated guidance was added to the intervention. Shirley, Iwata, Kahng, Mazaleski, & Lerman (1997) found that extinction for the maladaptive response was critical during acquisition of the replacement behavior but that once the replacement behavior was established reinforcement of the maladaptive behavior did not disrupt occurrence of the trained adaptive response. In other words, the trained communicative response effectively competed with the maladaptive behavior (SIB) once the communicative response had been well-established.

Principle 3: Function of Behavior May Change Depending on Supply/Demand of Available Reinforcers

It is a tempting misconception, perhaps, that once an adequate functional assessment has been performed that the “answer” can be obtained as to what the permanent and enduring function of the disruptive behavior is when in reality functional relationships may be more dynamic in most settings. Given a relatively static environment and a limited repertoire of responses, behavioral function may be more stable; however, given children with a broad range

of responses and a dynamic setting as is typically found in most classrooms, the function may shift frequently. In such cases, the child may engage in the same response to access escape from a non-preferred math assignment one day and to gain peer attention the next day (or moment). This phenomenon is called matching (Herrnstein, 1970; McDowell, 1982) and the effects are well-documented (Bizo, Remington, D'Souza, Heighway, & Baston, 2002; DeLeon, Iwata, Goh, & Worsdell, 1997). Mace and Roberts (1996) describe the range of variables that govern responding at a given moment in time. According to matching, the individual may engage in a behavior to obtain escape from an aversive task until the cost for engaging in that behavior becomes too great at which point the disruptive response may diminish or may persist to gain a lower quality reinforcer that can be obtained for a lesser cost.

Shore, Iwata, DeLeon, Kahng, and Smith (1997) describe substitutability as an extension of the matching law. Given concurrent operants, substitutability is the process by which one reinforcer is substituted for another. Much of the applied substitutability research has been conducted with automatically maintained behaviors for which arbitrary reinforcers may be used in treatment to reduce problematic behaviors, specifically SIB (Ringdahl, Vollmer, Marcus, & Roane, 1997). For example, Shore et al. (1997) demonstrated an inverse relationship between object manipulation and self-injurious behavior (SIB) with three clients exhibiting automatically maintained (i.e., undifferentiated pattern in the functional analysis) SIB. given continuous access to both responses. Further, the authors systematically varied response effort for object manipulation and demonstrated that SIB increased and object manipulation decreased as response effort for object manipulation was increased. The authors implemented a DRO procedure to investigate whether or not a preferred item would functionally substitute for the sensory stimulation or automatic reinforcement presumably provided by the SIB. They were unable to obtain a

treatment effect when making access to the preferred object contingent on the absence of SIB under varying schedule demands. One explanation suggested by the authors merits mention. The authors noted in particular that immediacy of reinforcement or reinforcement delay may have affected choice. That is, the self-injurious response was always immediately available, whereas there was a delay under both the DRO conditions and increased response effort conditions that may have explained the high rates of SIB. When Hanley, Piazza, and Fisher (1997) provided noncontingent access to tangible items for two clients exhibiting maladaptive behavior maintained by adult attention, maladaptive behavior was suppressed. One explanation for their findings is substitutability. That is, tangible items identified through a preference assessment substituted for adult attention (the functional analysis-identified reinforcer). Hence, given the principle of matching and the finding that individuals may exhibit the problem behavior to obtain a less preferred outcome or consequence under certain conditions (e.g., substituting peer attention for adult attention), interventionists must have a rudimentary understanding of the laws that govern functional relationships so that they can serve as detectives continually adjusting environmental variables to maximize desired responding and to minimize disruption.

Principle 5: Basic Learning Strategies Will Facilitate Acquisition and Fluency of New Behaviors

Typically, the first reaction to a problem behavior is to assume that the child knows how to perform the proper behavior but chooses to use inappropriate behavior. Based on this assumption, instructional strategies for social behaviors are ignored (Colvin & Sugai, 1988). Similar to academic instruction, studies have demonstrated instructional techniques for developing new prosocial behaviors such as prompting, modeling, rehearsal, shaping, discrimination training, performance feedback, and reinforcement (Wolery, Bailey & Sugai, 1988). More importantly, generalization or maintenance of the newly acquired behavior in

natural settings requires . Training under conditions similar to conditions in the natural environment using prompts with varying schedules of reinforcement are strategies that have been found to increase appropriate skill use over time and in various situations (Brown & Odom, 1994; Chandler, Lubeck, & Fowler, 1992)..

Summary and Conclusion

One type of “trouble,” which has heretofore remained unacknowledged, is the need for repeated troubleshooting in the same situation. Ideally this Troubleshooting checklist would prove useful to practitioners and would see repeated use *across* schools or settings. However, the consultant who is frequently called into the *same* situation for similar problems may wish to take a wider systems level perspective. Each call for troubleshooting and indeed each suspension of a student, each expulsion, and each office referral in a school are signals which should cause questions to be raised about the extent to which a school is providing opportunities for each student to accomplish important things and be acknowledged for those accomplishments. Moreover, if the same areas of the Troubleshooting checklist are noted over and over, then this is a call for closer examination of the system. For example, if there is a lack of well-established routines and procedures or a failure to provide active adult supervision in unstructured areas of the school, then problems *will* occur repeatedly and the use of a school-wide system, including all the necessary staff development and support, is the logical response. In summary, the Behavioral Intervention Troubleshooter has multiple uses (a) as a guide to finding and fixing problems with interventions, (b) as a checklist for designing interventions correctly in the first place, and (c) as a data gathering device to identify repeat issues which may need to be resolved at a systems level.

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Figure 1

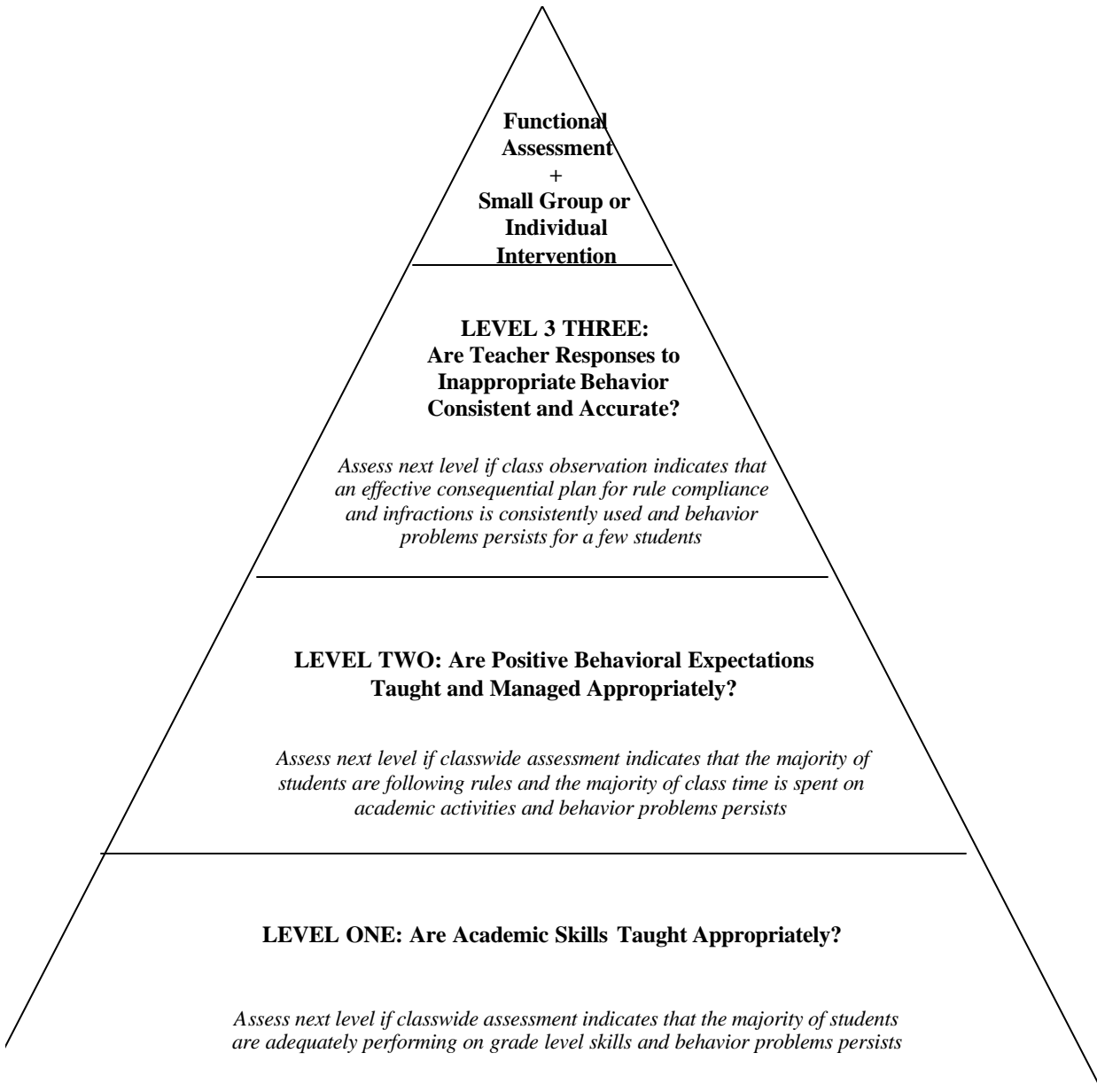


Figure 2

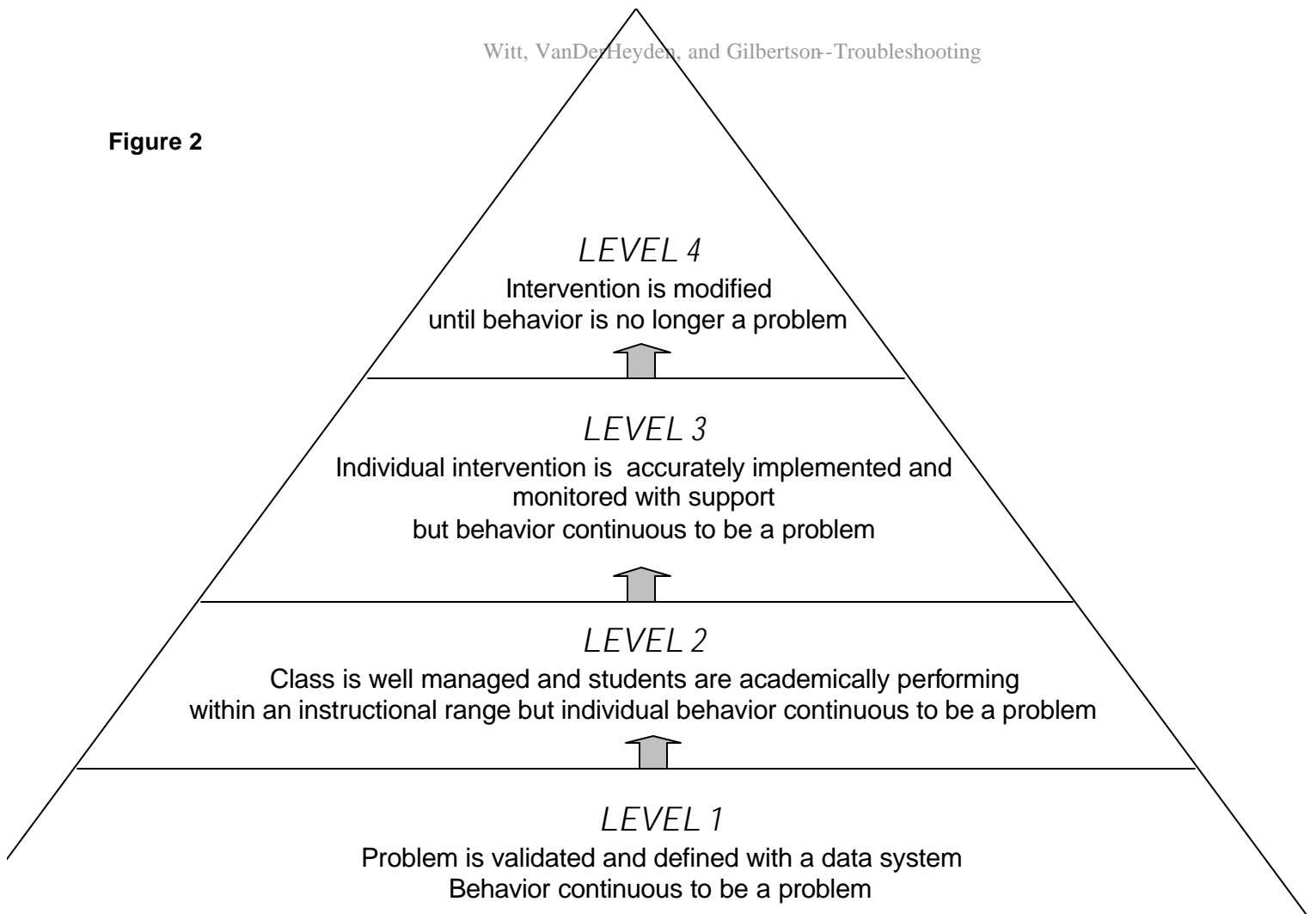


Figure 3. Behavioral Intervention Troubleshooter

Troubleshooting Component	Yes	No
LEVEL 1: Classroom Fundamentals		
Academic Skills are Taught Appropriately		
The teacher utilizes lesson plans which provide for frequent opportunities to respond, feedback and other instructional strategies that derive from the effective teaching literature.		
Most students can perform the academic work assigned to them (e.g., the class average performance on major academic tasks exceed national minimums for instructional placement standards).		
Positive Behavioral Expectations Taught and Managed Appropriately		
Classroom rules are posted?		
When observed, overall student appropriate behavior is greater than 70%.		
Rule violations are consequence according to posted rules 100% of the time		
There is evidence that the teacher has a systematic plan for addressing non-compliance with classroom rules and this plan is used consistently.		
There is evidence that the teacher has a systematic plan for managing common routines and procedures (e.g. transition between activities is less than 4 minutes)?		
<i>Summary: Overall students can perform assigned academic tasks, most students are compliant with posted rules, and teacher reaction to rule violations is planned and consistent. If yes proceed to Level 2.</i>		
LEVEL 2: Intervention Integrity		
Interventionist Support and Training was Provided		
The intervention was developed to insure that it required minimal classroom time and resources and fit within a daily classroom routines?		
Teacher committed to conduct intervention		
Are materials (e.g. reinforcers, worksheets) readily and continually available to interventionist?		
Was a step-by-step “coach card” describing how to implement intervention written for this intervention?		
Was interventionist shown how to implement intervention by knowledgeable “coach”?		
Did coach observe implementation of intervention at least once to insure that interventionist could use the intervention correctly and had all needed materials?		
Was follow-up support provided to interventionist after initial training?		
Integrity Monitoring is being Done		
Integrity is monitored via permanent products		
Permanent products tell directly and accurately whether intervention being used.		
Permanent products are reviewed twice per week.		
Review is with interventionist and one or more people.		
Performance Management is Being Used		
Are integrity data graphed?		
Are performance data graphed (replacement and problem behavior)?		
Has commitment been obtained from Interventionist to implement intervention?		
Has performance feedback been used?		

Is an administrator involved?		
<i>Summary: Data indicate that an accurately and consistently used intervention did not markedly change the problem behavior and proceeding to an individual analysis in Level 3 is warranted.</i>		
LEVEL 3: Intervention Design		
Was a functional assessment conducted?		
Was a hypothesis developed based on objective data?		
Was the student trained on a replacement behavior?		
After training, does the student use the replacement behavior fluently natural settings?		
Are antecedents for the replacement behavior salient and predictable to teacher /students?		
Are there regular opportunities for responding with feedback and reinforcement?		
When the student uses the replacement behavior, does the preferred consequence occur frequently, immediately and for a reasonable amount of time?		
When the problem behavior occurs, does the preferred consequence rarely occur?		
Is the intervention implemented in an environment that predictably produces the programmed consequence?		
Are adults and peers responding to replacement behavior as expected?		
Are there interfering behaviors?		
Was the intervention initially effective but positive results diminished?		