

Teaching Effort and the Future of Cognitive-Behavioral Interventions

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ABSTRACT: In this article we discuss two impediments to widespread adoption and implementation of cognitive-behavioral intervention (CBI) procedures by teachers of students with behavior disorders. First, its principles can be difficult, even for researchers and other specialists. Second, despite ample demonstration that teachers can be taught CBI techniques, implementation at significant scale is impeded by historical resistance to the use of behavioral techniques, even after 30 years of research meant to place behavior management in schools on a scientific basis. We conclude with comments on the likelihood of wider use of CBI and offer recommendations for a research implementation agenda that focuses on generalization of appropriate use of CBI across teachers and schools.

■ Cognitive-behavioral interventions (CBIs) are a conceptually related set of educational or therapeutic treatments. When applied to students with emotional and behavioral disorders (EBD), CBIs aim to improve students' social competence (Gresham, 1986) by teaching them to regulate (e.g., see Kanfer & Karoly, 1972; Karoly, 1993), control (e.g., see Polsgrove & Smith, 2004), and manage (e.g., see Reiber & McLaughlin, 2004) their own behavior. Varying treatments that employ CBIs have in common a conviction that students can and do learn to direct their own behavior and, in so doing, ultimately can direct at least a part of their own social development. Although different authors draw on different traditions, most share common though often implicit assumptions about the mutually modifying relationship between unobservable cognition and observable behavior in development and learning (Alexander, Graham, & Harris, 1998; Gerber, 1983). Although they may not acknowledge it, all researchers or therapists who employ CBIs require a foundational assumption that manipulation of overt speech and language can modify unobservable thoughts, which, in turn, can mediate behavior and learning in natural environments. Indeed, serious and chronic behavior problems may represent fundamental impairments in ability to regulate one's behavior. Applications of CBIs would seem, therefore, to provide a powerful approach to a range of behavior problems that otherwise have proved resistant—or only weakly responsive—to more traditional behavior management techniques.

CBI Background

Although there are multiple theoretical origins to the class of procedures we may identify as *cognitive-behavioral interventions* (CBI), they all comprise some application of more basic behavioral principles. When we observe young children, it is readily apparent that speech acts—interpreted by many to be an observable manifestation of thoughts—play some role in the development of certain kinds of problem solving. Meichenbaum (1977) reasoned that the association between thoughts and speech acts confers a mediating power on the speech acts to both guide behavior and, through competent guidance, to modify the underlying thoughts themselves.

Despite its reliance on unobservable cognitions as mediators of some kinds of learning, this formulation by Meichenbaum (1977), Mahoney (1974), and others promised a means by which an already well-established technology of behavior intervention could be applied to teaching complex social as well as academic problemsolving. By teaching students to manipulate the same procedures that interventionists had learned to use—for example, objective specification of critical behaviors, direct observation and recording, recognition or modification of antecedent stimuli, verbal prompts or guidance, and management of consequences—CBI would seem to accomplish all the same beneficial results and more. CBI not only gave access to important but invisible cognitive mediators, but it also increased the portability of interventions across time and contexts.

For example, in small sample studies, behavior interventions that use self-management techniques have been shown to be more effective than behavior programs that use teacher management alone (e.g., Fantuzzo, Polite, Cook, & Quinn, 1988). Self-management strategies also can be shown to be effective for students with EBD (Smith & Sugai, 2000) under similar controlled circumstances. In another study, students identified as learning disabled were observed by both a research assistant and the teacher after self-management strategies were taught by the research assistant (Dalton, Martella, & Marchland-Martella, 1999). Smith and Sugai (2000) used a similar research design with students identified with EBD and, as is the case in most demonstrations such as this, the students were trained in self-management strategies by the researcher. In fact, the majority of studies that assess CBI techniques also do not use teachers as interventionists (e.g., King, et al., 1998; Manning, 1988; Smith, Siegel, O'Connor, & Thomas, 1994). We view this finding as troubling when contemplating whether CBIs can be implemented effectively and efficiently in naturalistic settings on a larger scale.

In this article, we discuss the complex challenges facing specific application of cognitive-behavioral methods by general and special educators working with students with EBD. We do not seek here to evaluate research support leading to improvements of CBI techniques for students with EBD, as others, including authors in this special issue, have already done. Rather, we argue that schools as organizations create serious, chronic, and not well-understood barriers against teachers' use of scientific knowledge we already possess about CBI and far simpler interventions for students with EBD. In this way, we hope to illustrate why we believe that under current circumstances teachers are very unlikely to learn, adopt, and skillfully employ at any significant scale such sophisticated behavioral treatments as CBI.

Meta-Analyses of CBI: Missing Evidence

New interventions should be construed as experimental until such time as there are data demonstrating that they can be applied reliably well and with reliable results for students in normal school environments. Building on substantial evidence to support

use of behavioral techniques (Stage & Quiroz, 1997), there are a few meta-analytic studies that show CBI is effective compared to alternative (including no) treatments under certain circumstances, but there is reason to question if this evidence is sufficient to support widespread implementation in schools. For example, Dush and his colleagues reviewed 48 experimental studies in which children with clinically significant behavior problems were taught to make therapeutic self-statements (Dush, Hirt, & Schroeder, 1989) producing an average effect size of approximately 0.50. However, outcomes varied as a function of a number of contextual variables, including the experience of the therapists. Unfortunately, the studies reviewed do not establish that the self-talk promoted by the treatment preceded children's behavior change. Some studies used many components while others used only a few and, moreover, the studies summarized represented many different components frequently associated with CBIs.

Better evidence comes from Robinson and his colleagues (Robinson, Smith, Miller, & Brownell, 1999) who summarized 23 studies by calculating 172 effect sizes for cognitive-behavioral modification (CBM) treatments of hyperactivity and aggressive behaviors. The average effect size indicated that about 79% of students in the control groups, who did not receive treatment, performed below the average student receiving treatments with "a cognitive component."

In another study, Ghafoori & Tracz (2004) conducted a meta-analysis on teacher reports of disruptive behavior from 20 studies (88 effect sizes) of cognitive-behavioral interventions reported over the ten-year period from 1987 to 1997. CBI was more broadly described in this study as "carefully planned experiences that help [students] develop more adaptive problem solving strategies." Overall, these authors found reduced amounts of teacher-reported disruptive behavior by elementary school students who received CBIs. However, although Ghafoori and Tracz interpreted overall results as positive for CBI, the average effect size (0.29) is small compared to Robinson et al. (1999). But, more importantly, effect sizes in these studies varied substantially, from -1.06 to 1.42.

If we believe that CBI should no longer be considered *experimental* and, therefore, that we should seek broader implementation of CBI techniques, it is precisely such

variability in outcomes that we should want to explain (e.g., see Ager & Cole, 1991). This is true not only for CBIs but also for any and all instructional techniques. Because CBIs can consist of multiple components of explanation, modeling, training, practice, and maintenance, it is difficult to conclude from these studies that we know what components are most effective in what circumstances for which students. In the case of the Ghafoori and Tracz meta-analysis, the authors did not describe or assess effects for specific treatment components, an omission common to most reviews of CBI-related interventions. Nor did they describe how often teachers implemented interventions, fidelity to CBI requirements, what training was necessary for teachers, or what determined success in preparing teachers to conduct implementation. However, we do not fault the authors of meta-analyses because it is the authors of *the studies being summarized* who typically neglect to provide this important contextual information. Without such contextual information it is unlikely that we can successfully transfer CBIs from research to practice at any significant scale.

Why CBIs May Be Difficult to Implement in Real Classrooms

To the extent that we have sufficient knowledge about self-regulation, control, and management, and to the extent that this knowledge can be successfully applied to students with EBD, there remains serious questions about if and how we might rely on teachers in schools to be the interventionists. Our concern is that teachers both in special and general education, for a variety of reasons, may not be prepared or motivated to engage in the kind of teaching effort that successful behavior interventions require, particularly those as potentially complex as CBIs. Ultimately, the utility of CBIs in schools will require that these teachers understand how to design and apply CBIs, and that they are motivated and supported at a schoolwide level by administrators and peers to use these interventions effectively. Teachers are not therapists or researchers and, more importantly, school settings are not clinics or experimental environments. In order for teachers to successfully implement CBI in the classrooms, there must be system-wide (schoolwide) acceptance of the particular behavioral program, adequate teachers, training, and reinforcement (e.g., recognition

by administrators, positive response from peers, and positive student behavior changes) to motivate teachers to continue with the program.

Although it is always appropriate to recommend that university training programs include the most up-to-date research-supported methods in the professional education of teachers, it is also naïve to expect that preservice training alone will assure broader, appropriate use of CBI in schools. It is likewise naïve to believe that teachers are simply not motivated to use effective practices. Rather, the organization of teaching within schools tends to significantly condition—and in this case constrain—the ability of teachers to reliably implement powerful and sophisticated instructional methods.

It should be understood that successful adoption and implementation of comprehensive intervention “packages” such as *Second Step*, *Incredible Years*, or other such schoolwide packages with embedded CBI components achieve their success not from their variable CBI components, but rather because they are truly and thoughtfully schoolwide in concept and design. This does not mean that individual teachers cannot learn to have success in applying CBIs, or at least the principles of CBIs, to the behavior problems of their students. However, if the advantage of this knowledge is to achieve its broadest benefit, we should begin subjecting the vagaries of teachers’ learning of appropriate instructional behaviors to the same kind of rigorous, and contextualized, behavior analyses that we apply so successfully with students.

Teaching teachers to use cognitive-behavioral interventions requires methods of adult professional education that are themselves both cognitive and behavioral (e.g., see Payne & Manning, 1988). Teaching routines (i.e., behaviors), once established, are like habits. They are difficult to modify not only because they represent a strong history of reinforcement, but also because they serve an important function, to simplify for teachers the management of an otherwise dynamic and complex environment. Were we to talk about students with EBD in such situations, we would refer to self-management, self-regulation, and self-control. These are situations in which internally guided goals have to be super-imposed on highly salient environmental stimuli. That is, teaching a

teacher to not respond to student misbehavior with punishment, for example, is analogous to teaching a student with EBD not to act aggressively when they perceive someone else's behavior as aggressive toward them. In both situations, the actor has a reinforcement history that establishes a preference for a particular response. In part, though, such an automatic response may gain positive results in the short-term, but it can begin a sequence of events that create negative consequences in the long-term. However, because this sequence may be long and the consequences distant, the salience of negative consequence has to be increased in some way to influence present behavior.

While practicing teachers may have considerable skill, they experience constant and constantly shifting environmental challenge; hence, the value of routine. To assist them in continuing to learn how to manage their own behavior as well as their teaching environments, teachers need the administration and organization of the school to be purposefully, explicitly, and decisively supportive. Such positive support must address the physical workspace and work flow in which teachers are immersed, as well as the motivation, knowledge, and skills of individual teachers. Every researcher who has engaged in developing, implementing, and evaluating successful schoolwide behavior management systems has come to understand that it is the administration and organization of the school that is as much a target of intervention as the teachers themselves (March & Horner, 2002; Nelson, Martella, & Marchand-Martella, 2002; Turnbull et al., 2002). The amount and duration of effort necessary to modify schools at this level is substantial and it remains undemonstrated that we know how to mount such effort in a sustained and successful way—even for relatively simple behavior technologies.

Implementing Behavior Technologies: Hidden Problems

For many years, the field of special education has been successful in demonstrating repeatedly and empirically the effectiveness of managing environmental contingencies as a component in teaching socially appropriate and adaptive behaviors to EBD students. In its simplest applications, contingent reinforcement will reliably

maintain or increase desirable behaviors and can help teach and establish new behaviors by motivating a process of successively better approximations. Procedures derived in this way from well-articulated learning principles are true teaching technologies in the sense that they represent knowledge that, when reliably applied, yields reliable results.

There is an additional reason why we optimistically expect this technology to be adopted in practice. Teaching students who exhibit maladaptive and negative, sometimes aggressive or even violent, behaviors is difficult work and not as monetarily rewarding as alternative career paths. Perhaps, therefore, part of the reward for teaching students with EBD must be derived from successes associated with meaningful learning by students. From a behavioral standpoint, teachers—who ought to be as susceptible to the same behavior learning principles that we apply to students—should be motivated to behave in ways that lead to demonstrable success. In this case, success must be related at least to reduction of students' negative behaviors.

Given this analysis, one would expect that skillful use of contingency management procedures, a basic form of behavior management, by working classroom teachers would be well established and widespread. Moreover, if somehow any new or remaining teachers had not learned these management procedures, one also might expect that they would be quickly accepted, learned, and mastered. As we have been discussing, neither of these two expectations seem to have any basis in empirical fact. Why is this? Are teachers not susceptible to the same learning principles as their students? Do they work in environments in which these principles do not apply? Are we wrong in supposing that teachers are rewarded by their success in teaching demonstrably positive and valuable behaviors to their students? What's going on here? If our science is not wrong, then our analysis of the contextual variables that influence teacher learning is wrong, or at least inadequate.

Capacity to implement behavioral strategies begins with teachers' understanding of the principles of behavior. However, some research shows that teachers are ill-prepared in this regard. In a study by Myers and Holland (2000), for example, teachers were asked to read fictional behavioral problems with children and determine the function of the behavior. Few teachers were able to

discriminate between situations in which students were seeking peer attention from those in which they were trying to escape an aversive situation. Only half of the teachers were able to identify when students were trying to seek attention from the teacher. Only 42% of the special education teachers reported receiving specific training in functional analysis while just 17% of the general education teachers reported receiving such training. Moreover, the special education teachers did not feel that they were better at resolving problem behaviors, and in actuality they were only able to identify one of the problem behaviors with more ease than their general education colleagues. As a consequence, schools attempting to implement interventions may fail to target the real function of behaviors. Even when teachers may appear to be using research-validated practices, they may not be targeting appropriate behaviors for intervention and, therefore, may not see improved behavior and/or academic performance. Without behavior change, teachers may misjudge behavioral techniques as ineffective and motivation to engage in further development and practice of behavior management techniques may decline.

In a study with more positive findings, Sasso and colleagues (Sasso, Reimers, Cooper, Wacker, & Berg, 1992) showed that regular classroom teachers who received training in *functional behavior assessment* (FBA) were able to successfully identify functions of behaviors as well as develop effective interventions to reduce problem behavior. Whereas FBA can be successful in a classroom setting, it can be time consuming and difficult for teachers to learn and maintain. For example, Pakenham, Shute, and Reid (2004) reported using a simplified form of FBA to train a regular classroom teacher how to identify functions of disruptive behaviors in her classroom. FBA was simplified in this study because the authors recognized that expert procedures had to be made more practical for classroom teachers to use in the natural environment of the classroom.

Such studies are illustrative of the practical realities and hidden problems in implementing even simple behavioral technologies in natural school environments, especially when supporting research has been conducted under relatively controlled conditions. There is an enormous amount of literature supporting a range of behavior management interventions, but it takes skill, time and energy to teach teachers and promote adequate organizational

support for new practices. In fact, the majority of studies that focus on teachers as therapists/trainers have not addressed crucial questions related to the cost-effectiveness of implementation or the amount of teacher time and effort required to assure specified levels of success for specific interventions.

Some experimental research has been reported in which teachers have been taught to implement interventions. In general, CBI effectiveness has been a function of the time and resources required to prepare the teachers for delivering these interventions (e.g., Andrews, 1970; Estcheidt, 1991; Noell, Duhon, Gatti, & Connell, 2002). When training was less intense, teachers needed continuing support beyond the intervention period (Noell et al.). Also, in most cases, *special education* teachers were trained. Few studies follow teachers to learn if their behavior management abilities change and maintain as a function of training and participation in experiments.

Historical Resistance to Behavioral Techniques on a Classroom and Systems Level

Central to our argument about the organizational barriers to implementation of CBIs is the apparent anomaly that, while students' behavior problems in schools are pervasive and array along a continuum from the merely annoying to those that are clearly dangerous to themselves or others, teachers nevertheless display no natural tendency to adopt research-validated behavior management techniques. Students with EBD are on this continuum, to be sure, but we question if classroom teachers, who are not specialists, show evidence of teachers' effective behavior management in educating students with behavior problems but without EBD under normal school circumstances. It is because teachers must manage the less serious behaviors of all other children, not the fact that occasionally students with EBD may be present, that provides a basis for understanding teachers' normal uptake of new knowledge and techniques for managing challenging behaviors.

But herein lies a perplexing problem of scaling CBI: the problem of organizational, rather than individual teacher, barriers to sustained improvement. It is because teachers must cope with undesirable behavior as a natural part of each normal teaching day

that a foundation ought to exist for their acquisition of increasingly sophisticated behavior management skills. It is because of the pervasive need to direct behavior in school settings toward more successful learning, achievement, and development that teachers ought to be highly motivated to learn how to incorporate effective techniques and procedures in their everyday instructional practice. But, this foundation does not seem to exist and teachers do not seem to demonstrate the natural motivation we expect. It is critical to understand why this is so; otherwise, we cannot hope to make greater progress in increasing the application of CBI, regardless of how strong the supporting science may be.

Rubin and Balow (1978) reported results from a seven-year longitudinal study of teachers' perceptions of behavior problems in a single urban district cohort of students. Although only 7% of all students were identified by every one of their teachers, 67% of all students were perceived by at least one teacher as having behavior problems. The study was important because it showed that for a short window of time many students might be considered at risk for being identified as having behavior disorders because that is how some teachers perceived them. It is possible that this study showed merely that teachers were sometimes idiosyncratic in identifying students who might have appeared relatively unresponsive to teaching. On the other hand, these teachers also were very consistent in identifying as having behavior problems the same students that were identified by other teachers years before and years afterward. So, a more logical interpretation is that some students flirted with violating different teachers' behavior standards at some time during their elementary school career but were fortunate that one or more teachers *taught* them more positive ways to behave.

While all of Rubin and Balow's (1978) students clearly were not students with EBD, there is more recent evidence that a relatively large second-tier of students, whose behaviors are less severe or chronic, become increasingly disruptive in school when they do not receive appropriate interventions (Liapsin, Jolivet, & Scott, 2004; Turnbull et al., 2002). Turnbull et al. cited data collected by R. Horner and his colleagues from 26 "typical" middle schools that together enrolled over 15,000 students. Based on students' disciplinary referrals, Horner and his colleagues estimated that 15% of the

students had disciplinary records that placed them "at risk" while 9% were characterized as having "extreme" behavior problems.

Turnbull and her colleagues (2002) also examined similar data from a demonstrably high-risk school, one that was characterized by poverty, low performance, and violence. In this school, disciplinary records showed that 28% could be considered "at risk." Another 23% showed "chronic" and "intense" behavior problems and another 18% were characterized as having "extreme" behavior problems—double the percentage seen in "typical" schools.

Finally, in a recent national study conducted by Gottfredson and his colleagues (Gottfredson et al., 2000), staff from 874 schools responded to surveys concerning their behavior management efforts. Twenty-seven percent of teachers indicated that student misbehavior interfered with their teaching. In a fourth of all schools, over 40% of teachers indicated that misbehavior disrupted their teaching at least "a fair amount." Given these data, Rubin and Balow's (1978) earlier data do not seem at all far-fetched.

Our point is that, although only about 8% of all students with disabilities are students with EBD (Bradley, Henderson, & Monfore, 2004), behavior problems that create risk for these students as well as for specific learning environments are quite pervasive and exist along a continuum of need for prevention-oriented management and teaching. Moreover, it is clear from these data that the relatively high level of chronic, but relatively minor misbehavior in schools, requires active and effective engagement by regular classroom teachers and cannot be the responsibility of only special education professionals. Special education's potential for success with students with EBD, then, is inextricably linked to the capacity of regular classroom teachers to proactively and skillfully manage the high frequency, less severe behavior problems that occur naturally in schools. On the other hand, classroom teachers' ability to learn and effectively use relatively complex intervention procedures rests to a large extent on a schoolwide teaching capacity that consistently and effectively employs far simpler principles of behavior management.

Yet, Gottfredson et al. (2000) reported that almost every school they surveyed reported engagement in multiple prevention efforts. A remarkable 76% of schools reported using a "prevention curriculum, instruction,

or training" including use of "cognitive-behavioral modeling methods of instruction." Sixty-four percent of these schools reported using behavioral or behavior modification interventions. However, Gottfredson et al. note that schools were using a wide variety of different programs and strategies, but the "effectiveness of most of these activities is unknown" (p. 8). The authors also report the quality of prevention programs is "generally poor" and schools surveyed get a "passing grade" (i.e., adequate) on less than 60% of quality criteria. Overall, 47% of all prevention activities claimed by schools were evaluated as inadequate. This failure rate extends as well to circumstances in which

... only limited understanding of the effectiveness of research-based programs when they are implemented under more natural conditions, ... those few studies that have measured the level of implementation show remarkable variation in the strength and integrity of implementation and show that the strength of implementation is related to program outcome (Gottfredson et al., 2000, pg. 9).

Moreover, adequacy of professional development to assure effective use of any particular behavior prevention or intervention strategy is itself highly variable. If support for teachers' learning of effective practices in normal prevention of misbehavior is so questionable, it will come as no surprise that support for effectiveness with students who have EBD will be inadequate as well. In reviewing nationally representative data, Bradley and her colleagues recently reported that although more than half of all teachers who teach students with EBD receive some information (61%) and consultation (55%) regarding EBD, only 7% report receiving any inservice training (Bradley et al., 2004).

Further, another recent 5-year review summarized the kinds of behavior-oriented instructional "practices" that have been implemented successfully in general education classrooms or settings (Lewis, Hudson, Richter, & Johnson, 2004). In this review, the authors' identification of practices from publications required evidence not only of supporting experimental, or at least strong quasi-experimental, data but also the authors' judgment that practices were "accessible, usable, and trustworthy" (p. 249). The latter criteria seem to us to be critical in evaluating the potential for cognitive-behavioral interventions to be conducted by

working classroom teachers. Lewis et al.'s (2004) criteria are important because they highlight an important potential distinction between what kinds of practice are tentatively supported by science and what practices are actually instantiated at some nontrivial scale by current organization, administration, and funding of schools. In the Lewis et al. (2004) review, the general categories of practices supported in this way were:

1. *Teachers' use of praise and reinforcement.* Although the authors provide empirical evidence that teachers can be trained to use praise and other reinforcement appropriately with students who have EBD in their classrooms, the literature they reviewed has two significant limitations. First, there is a dearth of evidence that researchers have obtained similar success in training most teachers in randomly selected schools or sets of schools to use contingent reinforcement techniques correctly and effectively. Second, there is persuasive evidence that classroom teachers tend to praise students at very low rates without proper contingency and are frequently negative, despite near universal concern among teachers about students' misbehaviors. More discouraging still, there was evidence that even special education teachers praise at surprisingly low rates (Lewis et al., 2004).
2. *Provision of opportunities to respond during instruction, including preparing students in advance, modifying learning activities and materials to promote high levels of fluency, and providing students with alternate strategies for demonstrating their understanding and skills.* Opportunity to respond might be better understood as a necessary but not sufficient component of opportunity to learn (OTL). Compared to use of contingent reinforcement, this class of practices is notably more difficult to implement by classroom teachers. For instance, a relatively simple rule can be stated to guide teachers in applying contingent reinforcement, but the same is not true for principles for providing substantive OTL. To be effective with this class of practices, teachers must possess generalized knowledge about the triangular relationship that exists between and among (a) task/domain variables; (b) student learning history/characteristics; and (c) effective instructional tactics and

strategies for addressing both. Although it is true that teachers need to have sufficient practice to effectively implement any valid instructional method, general effectiveness with this class of practices requires broad experience in teaching a variety of specific content. Unfortunately, the available evidence seems to show that regular and special education teachers provide opportunities to respond at low rates despite significant evidence that increased academic responding is closely related to academic achievement (Lewis et al., 2004). Therefore, if this class of practices is applied only infrequently, it is highly unlikely that the broader OTL goal is being met in schools. Moreover, if the principles and methods that promote OTL are so difficult to employ in practice that they are only observed infrequently, then Lewis et al.'s third class of practices begin to seem discouragingly unlikely in actual classrooms.

3. Use of positive behavior support components including interventions based on functional assessment, social skills instruction, teaching of replacement behaviors, and instruction in various self-management procedures (emphasis added). Again, despite considerable empirical support for use of the several individual component practices listed in this class (e.g., positive behavior support, interventions, functional assessment), there are important caveats. First, it is only recently that empirical evidence has begun to be developed to show that these components can be successfully assembled and implemented in whole schools as a system of "positive behavior supports" (e.g., Liapsin et al., 2004; Sugai, Sprague, Horner, & Walker, 2000; Turnbull et al., 2002; Warren et al., 2003). Second, there is little or no evidence that such systemic changes can be promoted and sustained beyond the effects of initial projects with demonstrable improvements for students with serious behavior problems and in a large random sample of schools. Although very encouraging, initial research results will need to be replicated and expanded to less selective environments and under more normal resource conditions. Then, a meaningful foundation will exist for true experimentation on implementation of sophisticated procedures like CBIs. In sum, concerns exist regarding the prospects for

effective use of CBIs in schools, based on limitations in research findings on providing effective behavioral supports in educational settings.

Generalization of Implementation Effects

Researchers assume that there will be generalized acceptance and implementation of well-validated instructional practices for students with EBD. However, just as we have learned to test explicitly for generalization of improved behaviors across settings and time, we need to learn to test explicitly across teachers and schools for generalization of valid methods for producing behavior improvement.

Concern for generalization in this sense includes, but is not synonymous with, concern for treatment fidelity and ecological validity. Understood routinely, explicit attention to treatment fidelity leads us to question if a treatment has been implemented as conceived and planned to clarify the internal and external validity of observations. Similarly, attention to ecological validity causes us to ask questions about the degree to which treatments and interventions fit in natural environments. However, attention to treatment validity should be a concern as well to identify and assess those factors in the environment that tend to facilitate or constrain implementation. Likewise, determining only if treatments fit well in naturally occurring environments is insufficient when better-fitting, equally effective treatment options cannot be readily identified or created. In education, poor ecological fit can also be interpreted to mean that classroom or school practices must be altered so as to fit better with a necessary treatment.

Setting aside for the moment the problems inherent in system and individual teacher change, we still face significant barriers to widespread implementation of CBI in the classroom. For special education students with EBD to be successful it is not sufficient for teachers to learn and use more scientifically supported practices in some general sense. Rather, it is necessary for most teachers to do so in a purposeful manner and on a substantial scale. This is because we proceed under the joint expectations that students with behavior disorders not only should be exposed to high quality, appropriate instruction, but also that high quality instruction will occur to an ever greater extent in school

environments generally.

With these expectations, it is inescapable to conclude that many teachers across geography and time will be needed to produce ultimate outcomes for all students with behavior disorders. We can readily demonstrate that a single teacher can be taught to use CBI effectively in the classroom; however, it is more difficult to show that such change can be demonstrated for a significant number of teachers in their normal classroom settings. It follows, we believe, that to be systemically meaningful, improvements must be relatively simultaneous rather than incremental. That is, given the numbers of teachers for whom such knowledge and skill is important and the mobility of teachers in their professional lives, we cannot adopt a professional development strategy that focuses on one teacher at a time. Therefore, without intending to do so, we find ourselves right back in the middle of the apparent necessity of altering systems as our only path to implementation of CBI with high fidelity at a scale that is sufficient to impact the lives of students with behavior disorders.

What is at stake is not successful implementation of CBI alone, but rather success for special education as a school-based enterprise. The latter success requires that other teachers in the same school can be equally effective in applying CBI (or another similarly valid array of techniques) when they share responsibilities for the same students with EBD. If the kindergarten teacher is skilled, so too must be the first-grade teacher, and the second-grade teacher, and so on. Similarly, special education for students with EBD is not successful if teachers in Pine Street School are skilled at using CBI, but teachers across town at Elm Street School are not.

New technologies are not necessarily adopted immediately or, in some cases, at all. In profit-making enterprises, new technologies are adopted or rejected on the basis of some cost analysis. With some oversimplification, this analysis calculates if ultimate profits remain or increase once we have accounted for the costs associated with acquisition, implementation, and maintenance of the technology. Moreover, private sector decisionmakers might even calculate that a short-term loss is acceptable in exchange for a longer-term gain. Part of this calculation attempts to capture what it may cost in terms of training and education of human beings who must be responsible for using the new technology. In public education, as opposed

to private sector enterprise, there exists no comparable cost accounting for technological innovations. We have cited evidence showing that, even with relatively simple behavior technologies (e.g., contingency management) that are associated with clearly desirable effects and efficiencies, schools historically appear to have had considerable difficulties with adoption and successful implementation.

Conclusions

Our main theme in this article has been that, to implement relatively sophisticated behavioral techniques, such as CBIs, schools first have to be organized so as to promote, sustain, and increase higher levels of skills for teaching students with disabilities by all teachers. Special education is demonstrably insufficient if it depends on a relatively few, highly dispersed, specialists. Even if such specialists existed in substantial numbers—and they do not—their most powerful impact would depend on their ability to transfer knowledge and skills to general education colleagues. We have argued, therefore, that the educational needs of students with EBD globally cannot be met unless the baseline of teaching practice itself improves at some substantial scale.

What reason, therefore, do we have to expect that better scientific evidence alone will realize the potential effects of applying CBI with students who have EBD? Research on disabilities like EBD tends to frame intervention problems in terms of disabling conditions within students or the students with disabilities themselves, but often with unnecessary disregard for the real classrooms and schools where interventions must ultimately occur and their effects produced. True, everyone who conducts applied research has at least an intuition that problems of implementation at scale are complex. It is common, in fact, to refer to the considerable difficulties of implementing educational interventions at scale as the “research-to-practice” problem. But it is far less common to incorporate this so-called “problem” explicitly into our research agendas. We may discuss the problems of schoolwide implementation as anecdote, but rarely have we investigated these problems as part of our usual concern for generalization of learned behaviors.

One reason that we fail to integrate organizational problems that reflect scale of implementation more explicitly is because

large scale adoption and implementation are complex activities for schools and involve mechanisms, processes, and relationships for which our research methods and measures—tuned as they are to the study of students—may not be adequate. Students as units of analysis are difficult enough without having to consider the hierarchical nature of larger, more contextualized and contextualizing factors, such as teachers' instructional behaviors across classroom settings, across schools, or across districts. Another reason is that large scale research is very expensive and, even when resources may be available and adequate, it is logistically difficult, often beyond the capacity of individual researchers. A third reason may be that we believe that the problems of implementation are simply not our problems, but rather problems for researchers in other disciplines with other tools.

If this portrayal sounds discouraging, there is reason to hope. Hope comes if we turn our research attention to teachers and schools more directly. The same rigorous analyses and experimentation that we perform successfully on interventions with students who have EBD must be expanded to include the characteristics of teachers, their "resistance to treatment" characteristics, and those aspects of treatment resistance that are located in the school organization, administration, and leadership. Once we can reliably demonstrate that multiples of teachers can learn, implement, and sustain use of CBIs, we may contemplate interventions with large numbers of teachers within and between schools, as well as with the administrative and organizational contexts that enclose and condition teaching practice (i.e., teaching behavior). If we believe that powerful behavioral techniques like CBI can have important benefits for students with EBD, we must be prepared to take this field's research agenda to a higher level.

AUTHORS' NOTES

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