Bridging the Gap Between Clinical and Classroom Intervention: Keystone Approaches for Students With Challenging Behavior

Joseph M. Ducharme and Carly Shecter
University of Toronto

Abstract. Although not trained as treatment providers, teachers are increasingly faced with students who present challenging behavioral issues that require intervention. Teachers often resort to reactive and punitive strategies that have many negative side effects and drawbacks because they lack specific training in managing problem behavior in the classroom. Functional analysis and assessment approaches are commonly recommended by clinical researchers and have been demonstrated effective for managing problem behavior, but are sometimes impractical for regular classroom use. In this article, we propose a “keystone” approach to classroom management that may meet the clinical needs of children with challenging behavior while potentially serving as a more practical classroom alternative to commonly recommended strategies. With this approach, teachers are taught to focus on a circumscribed set of skills that have the potential to produce widespread improvement in child outcomes and render problem behavior unnecessary. Empirical support for individual components of this approach is discussed.

Estimates indicate that between 12 and 22% of children in school experience challenges related to a diagnosable mental, emotional, or behavioral disorder (Adelman & Taylor, 2002). A large proportion of these students have special needs that require interventions intensive enough to exceed the resources typically available in a classroom (Dunn & Baker, 2002), but only a small number actually receive treatment (Pastor & Reuben, 2002).

Dealing with student problem behavior is one of the most pressing concerns facing educators in the classroom. A number of survey studies indicate that teachers feel inadequately trained to manage such difficulties (Buchanan, Gueldner, Tran, & Merrell, 2009; Justice & Espinoza, 2007), a circumstance that contributes to high levels of teacher stress and burnout (Hastings & Bham, 2003). Moreover, high teacher stress can lead to use of harsher discipline strategies and less time spent engaging students in a positive manner (Clunies-Ross, Little, & Kienhuis, 2008).

In this article, we propose a novel strategy for assisting teachers in managing problem behavior in the classroom. This approach, which we refer to as “keystone” intervention, may have the potential to provide positive and proactive strategies for building adaptive

Correspondence regarding this article should be addressed to Joseph M. Ducharme, Ontario Institute for Studies in Education, University of Toronto, 252 Bloor Street West, Toronto, ON M5S 1V6, Canada; e-mail: joe.ducharme@utoronto.ca

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classroom skills and reducing challenging student behavior, thereby reducing the need for punitive discipline techniques. We will begin by discussing concerns with more traditional reactive approaches to classroom management, then consider some of the limitations of classroom-based use of functional assessment strategies, the current state of the art for remediation of problem behavior. We will review a model for classroom management that includes four keystone skills for which there is extensive evidence of broad positive change when targeted for intervention, as well as implications for education and future research needed to corroborate the approach.

Reactive Classroom Management Strategies

Reactive classroom management involves use of techniques focused on immediate termination of problem behavior, typically by means of consequences assumed to be aversive to the student. Many teachers use reactive techniques, such as reprimands and classroom ejections, to manage misbehavior in their classrooms (Clunies-Ross et al., 2008; Infantino & Little, 2005; Maag, 2001). Poulou and Norwich (2000) found that although teachers reported preferring use of positive reinforcement, observations indicated that they were more likely to use punishments or threats.

Reactive approaches may be the default strategy for many teachers who have not been trained in classroom management because they are quick and easy to administer (Maag, 2001) and often result in the desired short-term outcome of stopping the problem response (Lerman & Vorndran, 2002). Further, the abrupt termination of disruptive behavior can provide relief to the teacher, increasing the likelihood of a similar reaction to classroom misbehavior in the future.

There are concerns with the use of reactive procedures in the classroom, however. First, these strategies sometimes result in inadvertent reinforcement of problem behavior, thereby increasing the probability of future recurrence (Maag, 2001). For example, sending a child out of the classroom when his problem behavior is focused on avoiding challenging classroom demands may provide him with the escape he was seeking.

Even when the consequence used by the teacher serves the intended role of punishment for the problem response, there are concerns. For example, behavior change brought about by the use of punishment rarely generalizes beyond the circumstances in which the consequence is applied (Lerman & Vorndran, 2002). Further, problem behaviors are often a means of adaptation to challenging environments that children cannot manage effectively with their current behavioral repertoire (Carr et al., 1994; Ducharme & Harris, 2005). Reduction of such responses using punishment is unlikely to produce long-term improvements because such suppression does not provide the child with a skill set that can be used as an alternative means of coping with difficult circumstances.

Proactive Classroom Management Strategies and Functional Assessment

In development of strategies for classroom management, the field of education has been informed by approaches used for the clinical treatment of problem behavior. In particular, research on functional assessment and intervention, one of the most commonly recommended intervention approaches for problem behavior in the clinical literature (Hanley, Iwata, & McCord, 2003), has been influential. Through functional assessment, the clinician determines antecedent and consequent conditions in the environment that play a role in maintaining the problem behavior (e.g., Piazza, Hanley, & Fisher, 1996). Such analysis provides information that can be used to develop an intervention involving modification of the context of the child to encourage prosocial responding and reduce the need for problem behavior (Hanley et al., 2003).

Dunlap, Kern, DePerczel, and Clark (1993) described the three-step procedure commonly used in a functional analysis, the most sophisticated form of functional assessment. First, hypotheses are generated based on
observations of the child regarding the purpose or function that the problem behavior serves for the child and the contextual variables maintaining it. Next, environmental conditions are systematically manipulated to test the potential function of the problem behavior. For example, if a student’s disruptive behavior is hypothesized to serve an escape function during difficult tasks, then the contextual modification might involve reducing demands to determine the effect on the misbehavior. If the disruptive behavior decreases under these altered circumstances, task demands can be reintroduced to further test the hypothesis. Finally, once a relationship between the problem behavior, antecedents, and behavioral outcomes is verified, an intervention is developed to modify the environment, often involving teaching a prosocial replacement behavior that serves the same function as the problem behavior (e.g., appropriate strategies for requesting attention, help, or a break from the difficult task). This skill building approach can provide the child with a prosocial response that will allow ready access to the same outcome being sought with the problem response, thereby rendering problem behavior unnecessary. Moreover, the treatment provider can use functional analysis to incorporate “extinction” strategies to ensure that the problem behavior no longer provides access to desired outcomes for the child (Ducharme & van Houten, 1994; Dunlap et al., 1993). Thus, a teacher could be taught to provide no reaction to the problem behavior if the functional analysis indicated that the outcome being sought by the child was attention (Iwata, Dorsey, Slifer, & Bauman, 1994).

Although observation and systematic alteration of contextual conditions is a hallmark of formal functional analysis, other less direct forms of functional assessment are often used (English & Anderson, 2006). In fact, some researchers (e.g., Broussard & Northup, 1995; DuPaul & Ervin, 1996) differentially define functional analysis and functional assessment, with functional analysis involving direct experimental manipulation of environmental variables, and functional assessment representing use of multiple, often less direct, assessment approaches to gain contextual information. These less rigorous strategies can include informal observations, interviews, archival reviews, and rating scales (Sugai, Lewis-Palmer, & Hagan-Burke, 1999-2000). It is also important to note that much recent research has focused on strategies to make functional assessment and analysis procedures more practical and brief (e.g., Perrin, Perrin, Hill, & DiNovi, 2008; Boyajian, DuPaul, Handler, Eckert, & McGoey, 2001).

The functional assessment model has been effectively applied to a range of behaviors and populations, including aggression and disruptive behavior (Hanley, Iwata, & McCord, 2003), and is commonly recommended in the classroom management literature. Approximately half of the 150 school-based intervention studies published in the Journal of Applied Behavior Analysis between 1991 and 1999 used functional assessment (Gresham, McIntyre et al., 2004). The approach is also an essential component of school-based positive behavior support (Sugai et al., 2000), a sophisticated classroom management system that has received extensive empirical support (Safran & Oswald, 2003).

Notwithstanding its widespread use in the treatment literature, functional assessment is not widely accepted or sufficiently practiced by teachers in the classroom (Gresham, 2004). Teacher resistance may be from a wide range of factors, including the complexity of the approach, the time and special expertise it requires, and challenges with applicability to natural environments (DuPaul & Ervin, 1996). For example, many researchers have commented on the large time commitment required to conduct functional assessments effectively (DuPaul & Ervin, 1996; Daly, Witt, Martens, & Dool, 1997; Nelson, Roberts, Rutherford, Mathur, & Aaroe, 1999). Teachers working without the assistance of psychologists or other classroom consultants need to make a substantial time commitment for assessment and intervention of each student with behavioral difficulties. Given the time and effort required, it is likely that only a small proportion of the many students who need
such intervention will end up receiving it (Adelman & Taylor, 2002).

A factor that further complicates the implementation of a functional assessment involves the topography or form of a behavior (e.g., hitting, swearing, destroying property). Behavioral topography rarely provides clues to how the behavior functions for a child. Although a problem response may look similar across different students, the behavior may serve very different purposes for each individual (Vollmer & Northup, 1996). For example, one student may tear up his assignment to access teacher attention; another may display the same behavior as a means of escaping difficult tasks. Correct identification of the relevant outcome attained following a problem response is crucial to the development of function-based behavioral treatments (Lewis & Sugai, 1996; Vollmer & Northup, 1996).

Based on their review of functional analysis studies, Hanley et al. (2003) note that “considering the trends in the summary of function across topography, it appears that behavioral function and topography remain independent such that function cannot be predicted by the topography of problem behavior” (p. 167). The fact that topographically similar behaviors can require completely different intervention approaches may be difficult for teachers to accept given their limited available time for behavioral intervention and the not unreasonable expectation that information gleaned from observations of one child should be adaptable to another with a similar behavioral repertoire.

A related concern involves the range of possible functions or reinforcers that can maintain specific behaviors. Several studies have demonstrated that individual problem responses can serve multiple functions for the child, making it particularly difficult for teachers to isolate the variables maintaining them (e.g., Witt, VanDerHeyden, & Gilbertson, 2004). Moreover, because of the complexities in determining behavioral functions and other maintaining variables of problem behavior, functional assessment, for the most part, is an individualized approach to intervention development. This creates a daunting challenge in many school boards where there is often a need for intervention for large numbers of students. Isolating multiple functions and multiple maintaining variables for multiple behaviors across multiple children becomes little more than a pipe dream with the limited resources available in most schools.

For these reasons, functional assessment in the classroom remains a potentially complex, time-intensive, and impractical process that does not always yield information readily usable by teachers. Gresham (2004) summarized the current state of functional behavior analysis: “Although much progress has been made over the past 15 years in FBA, the extent to which these findings can be generalized across populations, methods, settings, response classes, and practitioners is not well established” (p. 335).

Although there are limitations to functional assessment strategies that can compromise their effective use in the classroom, they continue to represent the best strategies we have for clinical and educational intervention, with far more empirical support than any other strategy. However, the previous discussion demonstrates that there may be some benefit to investigating other strategies that have some potential for remedying the concerns that have caused functional assessment strategies to be disregarded by many teachers as a means of dealing with problem behavior. One possible intervention strategy that may provide such an alternative can be referred to as “keystone” intervention.

The Keystone Approach

Children with conduct difficulties often demonstrate multiple behavioral difficulties (Taylor, Eddy, & Biglan, 1999). Wittlieb, Eift, Wilson, and Evans (1978) reviewed 36 single-case child behavior therapy studies and found that there was more than one presenting problem in 67% of the cases. This within-child prevalence of behavioral difficulties can present a serious challenge to treatment providers, often adding further to the complexity, length, and expense of intervention. However, several investigators have conducted research that is
pertinent to this clinical concern. Their findings show that targeting specific behaviors for modification can lead to positive changes in other behaviors that were never targeted. This is an important finding from a clinical perspective as it has led to the recognition that teaching specific foundational or keystone skills and behaviors can produce broad benefits for children in areas for which no other intervention was applied (Barnett, Bauer, Ehrhardt, Lentz, & Stollar, 1996; Lalli, Kates, & Casey, 1999; Soutor, Houlihan, & Young, 1994; Wahler, 1975). Several researchers have attempted to define the keystone concept, and virtually all of the definitions include some combination of the following components: a keystone behavior is a relatively circumscribed target behavior that is foundational to a range of skills and related to other responses such that, when modified, can have a substantial positive influence on those other responses (Barnett et al., 1996; Haynes, 1988; Nelson, 1988; Rincover, 1981; Voeltz & Evan, 1982).

Although several explanations have been proposed for this effect, one of the most commonly cited involves the concept of response class. Behaviors that belong to the same response class provide access to similar classes of reinforcement or have common effects on the environment (Lalli, Mace, Wohl, & Livezey, 1995). For example, Carr and Durand (1985) noted that communication and problem behavior can belong to the same response class because both can provide access to the same outcome (e.g., escape from an unpleasant task can be achieved by means of a tantrum or with the statement “I need to take a break now”).

When multiple behaviors belong to the same response class, intervention with one may result in covariant changes to the others (Kazdin, 1982; Wahler, 1975). In the example just cited, teaching the child to say “I need a break now” (and ensuring that the comment leads to the desired break) will likely render the tantrum being used to gain escape unnecessary, causing such problem responses to decrease. This process of altering one behavior by teaching an alternative response that serves the same function has also been referred to as functional equivalence (Ducharme, 2000; Langdon, Carr, & Owen-DeSchryver, 2008).

The concept of “keystone” is an important one for clinicians and care providers because it could provide the potential to modify a range of problem behaviors with intervention focused on just one or a few target areas. Thus, behaviors that are too numerous, difficult, expensive, or time-consuming to modify directly can be changed by teaching, prompting, and reinforcing specific responses and response clusters that can be manipulated more practically and efficiently. Teaching keystone behaviors could feasibly reduce the need for reactive or punitive strategies to suppress problem behaviors, as well as the likelihood of adverse side effects often associated with punishment (Cataldo, Ward, Russo, Riordan, & Bennett, 1986; Russo, Cataldo, & Cushing, 1981). Moreover, a keystone focus may have the potential to reduce the need for formal functional assessment. Rather than focusing resources on observations of potential maintaining variables in the child’s environment, intervention agents can put their time and effort into teaching a few foundational skills that will produce broad positive changes in the child’s well-being. Knowledge about responses or skill sets that have been demonstrated to covary with problem behaviors can be translated into a simplified selection of intervention targets for producing optimal treatment effects (Nelson, 1988).

We developed a conceptual model, the keystone intervention model, as a means of defining the keystone skills most relevant to proactive classroom management. In a school setting, a student’s success is dependent on his or her ability to manage certain core points of interface with the classroom environment—that is, the teacher, peers, and curriculum. A child who can interact effectively with teachers, by working cooperatively within the demands and constraints set forth by classroom staff, is much more likely to succeed than the student whose interactions involve defiance and opposition to teacher requests. Thus, student compliance with teacher directives is an essential consideration in the classroom. Similarly, students need to interact effectively
with other students, getting their wants and needs met and accommodating the wants and needs of their peers. In this case, peer interaction or social skills is another key element to student success. Finally, students must be able to interface effectively with required academic tasks, knowing how to apply themselves to assignments and persist with them, even when tasks appear overly unpleasant or challenging. Consequently, students need to possess well-developed on-task skills.

There is one other skill domain that moderates the ability of students to interface effectively with teachers, peers, and curriculum. Students will have great difficulty accomplishing objectives in their classroom interactions and efforts if they have communication deficits. Communication skills are essential to school and classroom success, allowing students to access positive attention, convey their feelings, obtain assistance, play cooperatively, and perform any number of other important interactional undertakings. Thus, communication skills are an essential component of a keystone approach to classroom management.

Following from this classroom interface conceptualization (see Figure 1), students must have four core competencies to attain a functional level of achievement and success in educational settings: they must possess a degree of compliance skills, social skills, on-task skills, and communication skills that are consistent with their developmental level and that of their peers. Of interest to the present discussion, a review of the clinical literature reveals that for all four of these core skills, there is at least suggestive evidence of wide-ranging positive effects when they are targeted independently for intervention. In the following sections, we will discuss each of these skills individually and present research evidence documenting their keystone nature.

Compliance

Compliance is the willingness of a child to adhere to the requests and instructions of authority figures. Such cooperation with adults is critical to the achievement of almost any goal in the home or school environment (Ducharme, 2007). Compliance plays an essential role in many seminal areas of development, including autonomy, internalization of moral values, self-control, and socialization (McMahon & Forehand, 2005). Noncompliance is prevalent in nearly all externalizing disorders in children and is a key element in the diagnosis of Oppositional defiant disorder (American Psychiatric Association, 2000). In school, children’s noncompliance and the challenging behaviors that sometimes accompany it (e.g., tantrums, whining, arguing, and so on) serve as barriers to academic success and peer relations (Roberts, Tingstrom, Olmi, & Bellipanni, 2008).

Compliance is frequently targeted in interventions because of its keystone characteristics; improvements in compliance are commonly associated with collateral reductions in problem behaviors and improvements in untargeted prosocial behaviors, such as academic achievement and social skills (Cataldo et al., 1986; Ducharme & Popynick, 1993; Matheson & Shriver, 2005; Parrish, Cataldo, Kolko, Neef, & Egel, 1986; Russo et al., 1981; Soutor et al., 1994). Russo et al. (1981) implemented a compliance training procedure with three preschoolers who were generally noncompliant with adult requests and showed multiple additional behavior problems, including crying, aggression, self-injurious behavior, hair pulling, and thumb-sucking. Using tangible and social rewards, the researchers provided reinforcement contingent on compliance and administered no decelerative consequences for noncompliance or problem behavior. With this procedure, compliance increased and problem responding decreased. When compliance training procedures were discontinued, problem responding returned and decreased again when reinforcement for compliance was reinstated.

Cataldo et al. (1986) investigated whether the inverse relationship between aberrant behavior and compliance found in the Russo et al. (1981) study resulted from contingent reinforcement and improvement of compliance rather than to the addition of reinforcing consequences for noncompliance or problem behavior. With this procedure, compliance increased and problem behavior decreased. When compliance training procedures were discontinued, problem responding returned and decreased again when reinforcement for compliance was reinstituted.

Cataldo et al. (1986) investigated whether the inverse relationship between aberrant behavior and compliance found in the Russo et al. (1981) study resulted from contingent reinforcement and improvement of compliance rather than to the addition of reinforcing consequences in general. Participants were 4 children aged 3–7 who demon-
Figure 1. The keystone model for proactive classroom intervention.
strated a range of inappropriate behaviors, including noncompliance, aggression, excessive crying, and destructive behaviors. In a multiple baseline design, subjects were exposed to three conditions—no reinforcement, noncontingent reinforcement, and reinforcement contingent on compliance. Problem behaviors consistently decreased only when reinforcement was contingent on compliance. In a more recent study, Piazza et al. (1997) demonstrated that positive reinforcement contingent on compliance produced concomitant decreases in problem behavior for children with mild mental retardation.

Ducharme and colleagues (e.g., Ducharme & Popynick, 1993; Ducharme, Pontes, Guger, Crozier, Lucas & Popynick, 1994; Ducharme, Atkinson, & Poulton, 2000; Ducharme, Spencer, Davidson, & Rushford, 2002) conducted a series of studies evaluating a nonintrusive approach to treatment of severe problem behavior called Errorless Compliance Training (ECT). With this approach, parents encourage children to be cooperative with requests by proceeding hierarchically in treatment, from requests that the child complies to consistently (e.g., “eat you cookie”) to requests that the child rarely follows (e.g., “turn off the television”). Parents are directed to provide reinforcement (typically praise) for each compliant response and move slowly enough through the hierarchy that compliance remains high, even when lower probability requests are gradually faded in. By the end of treatment, caregivers are typically able to deliver even the lowest probability requests with no return to noncompliant responding.

Ducharme and Popynick (1993) taught parents to use ECT with 4 children with developmental disabilities, and found that ECT was effective at producing generalized and durable compliance gains, as well as significant covariant reductions in oppositional behavior in all 4 children. A replication of Ducharme and Popynick (1993) with an abbreviated version of ECT found similar treatment, generalization, and covariant results with 4 children with developmental disabilities and 2 nondelayed siblings (Ducharme, Pontes, Guger, Crozier, Lucas, & Popynick, 1994). Moreover, ECT was used with children from violent homes to increase compliance and improve parent perceptions of externalizing, internalizing, and total behavior problems (Ducharme, Atkinson, & Poulton, 2000), and within a classroom setting to improve compliance with children with developmental disabilities (Ducharme & Diadamo, 2005). A recently conducted variation of ECT that targeted compliance to academic requests in children with autism spectrum disorders resulted in impressive improvements in child compliance and increased duration of on-task skills and reductions in disruptive classroom behavior (Ducharme & Ng, 2011).

Student compliance has also been shown to covary with academic and preacademic skills. Matheson and Shriver (2005) trained three teachers to deliver effective commands and provide praise for student compliance in a classroom setting. Compliance increased with the teachers’ use of effective commands, and even more so when praise was added contingent on compliance. As student compliance increased, academic behaviors (on-task behavior, attention to instruction, completion of tasks) improved and disruptive behaviors decreased. Moreover, when praise and edible rewards were used to reinforce compliance to requests with 3-year-old twin boys diagnosed with autism and a speech/language delay, compliance, attending, and direct verbalizations all increased (Soutor et al., 1994).

Social Skills

Social interaction is a key aspect of adaptive functioning and a frequent deficit in individuals with emotional and behavioral disorders (Mansell, Ashman, Macdonald, & Beadle-Brown, 2002). Matson, Minshawi, Gonzalez, and Mayville (2006) defined social skills as “the observable and measurable interpersonal behaviors that promote independence and social desirability” (p. 496). Social skills provide the means to interact effectively with other people, correctly assess and respond to various social contexts and cues, understand and abide by social rules and avoid interper-
sonal conflicts (Matson et al., 2006). Moreover, social skills influence one’s ability to obtain peer acceptance, sustain meaningful interpersonal relationships, and integrate into society (Newcomb & Bagwell, 1995).

Social skill deficits place youth at risk for problem behavior (Duncan, Matson, Bamburg, Cherry, & Buckley, 1999; Koegel, Koegel, Hurley, & Frea, 1992), perhaps because children who lack socially appropriate responses may rely on antisocial responding to meet their social needs (Matson et al., 2006). Moreover, previous research with 495 individuals with intellectual disabilities found that social impairment positively correlated with problem behaviors, and negatively correlated with adaptive behaviors (Mansell et al., 2002). Duncan et al. (1999) compared groups of individuals with severe learning disabilities and found that those groups who also demonstrated problem behavior (e.g., aggression and self-injury) had significantly lower levels of social skills than did the group with learning disabilities only. A number of studies indicate that weak social skills and peer rejection may be risk factors for later underachievement, school drop-out, juvenile delinquency, low self-esteem, and conduct problems in youth (e.g., Coie, Lochman, Terry, & Hyman, 1992; Walker, Schwarz, Nippold, & Irvin, 1994).

Intervention focused on teaching social skills appears to serve a keystone function, leading to widespread positive change in child behavior. A meta-analysis of 29 social skills training (SST) studies conducted with groups of children experiencing externalizing behavior problems found an overall mean effect size of $r = 55$, which indicated that at post-test, approximately 71% of the children in the treatment groups demonstrated reduced antisocial behavior, compared to only 29% of children in the control groups (Ang & Hughes, 2002). Gresham, Cook et al. (2004) provided a comprehensive analysis of six meta-analyses of SST interventions with youth at risk for emotional and behavioral disorders. Based on five of the six meta-analyses examined, the researchers found a weighted grand mean effect size of $r = 29$, indicating that about 65% of the participants in the SST groups demonstrated reduced problem behaviors and/or increased prosocial skills compared to 35% of those in the control groups.

Several studies have focused on the keystone effects of social skills intervention on the problem behavior of children with autism. Koegel et al. (1992) used SST with an emphasis on self-management to teach 4 children with autism how to manage their interactions across multiple settings. The social interactions of all children improved in the clinic and disruptive behavior patterns decreased. For 3 of the children, results in the home and community environments paralleled improvements in the clinic setting. Moreover, peers without disabilities were trained to initiate social interactions during classroom playtime with children with autism and related disabilities who engaged in stereotypic behavior, which resulted in increased social interactions of the children with disabilities and collateral reductions in stereotypic behavior (Lee & Odom, 1996; Lee, Odom, & Loftin, 2007. Loftin, Odom, and Lantz (2008) found similar results in a study of 3 children with autism who exhibited repetitive motor behaviors. When the children were taught to initiate social interactions with their peers, as well as to self-monitor and record their initiations, social initiations increased and repetitive motor behaviors decreased.

Ducharme, Folino, and Derosie (2008) developed a social skills treatment that emphasized acquiescence (defined as the ability to give in to the needs and will of other children) as an underpinning for all social skills trained in the program. Role-playing and modeling of acquiescence behavior with 8 children with severe behavior problems resulted in improvements in acquiescence and other prosocial behaviors, as well as collateral decreases in antisocial behavior. The findings of this study were particularly encouraging because the intervention was highly efficient, requiring considerably less training time than most other SST packages.

Although social skills interventions are often combined with other procedures in previous research, making it difficult to determine component contributions, there is sufficient
evidence to suggest that such training can produce covariant effects on problem behavior and skills not specifically trained. The concern with this particular skill cluster is the breadth of training required to cover all of the relevant social responses required to ensure effective social interactions by children with skill deficiencies. Thus, there is a need for research on more efficient strategies for teaching social skills and potential keystone subskills like acquiescence (Ducharme et al., 2008) to reduce the time and expense involved in this form of intervention.

On-task Behavior

Students are considered to be on task when they are actively engaged in classroom activities that facilitate learning, and not engaged in behaviors that detract from learning (Lee, Kelly, & Nyre, 1999). Given that a child cannot accomplish academically without attending to and engaging in the required task, on-task behavior is a necessary prerequisite for effective performance and achievement in the classroom (Richmond, McCroskey, Kearney, & Plax, 1987). In an examination of students’ academic behavior in high school classrooms, Frederick (1977) found that high-achieving students were academically engaged 75% of the time, compared to 51% for low-achieving students, demonstrating the importance of on-task behavior to academic performance.

Problem behavior during academic tasks is often focused on accessing specific outcomes, such as escape from difficult tasks or assistance from the teacher (Lalli et al., 1999); if students view a task as unpleasant or difficult, they are more likely to demonstrate problem responses. Moreover, on-task and problem behaviors are topographically incompatible; when students are productively engaged in an activity, problem responses cannot occur unless they are minor enough (e.g., tapping a pencil) to allow continued involvement in the task. Thus, targeting on-task behavior for intervention is likely to produce the same covariant effects as other keystone skills.

A number of studies have demonstrated the broad-ranging effects of intervening to improve on-task skills. Ducharme and Harris (2005) and Ducharme, Lucas, and Pontes (1994) employed errorless embedding, a graduated and nonintrusive teaching strategy, to increase on-task responding and produce collateral reductions in off-task and disruptive behavior in students with severe behavioral difficulties (Ducharme & Harris, 2005) and in a young girl with autism (Ducharme, Lucas, & Pontes, 1994). Witt, Hannafin, and Martens (1983) found significant increases in percentage of academic responses and decreases in percentage of problem behavior following home-based academic reinforcement. Lalli et al. (1999) demonstrated that accurate academic responding was inversely functionally related with aggression in 2 boys with mental retardation.

Moreover, Wood, Murdock, Cronin, Dawson, and Kirby (1998) found that targeting on-task behavior led to improvements in academic performance, in addition to collateral reductions in problem behavior. McLaughlin, Dolliver, and Malaby (1979) provided token reinforcement for engagement in schoolwork to 10 students receiving special services, resulting in improvements in academic achievement. Similarly, McLaughlin, Laffey, and Malaby (1977) found improvements in the on-task behavior of students as well as increases in the percentage of correct math problems following teacher instruction and reinforcement for on-task behavior. Covariation between on-task behavior and academic achievement has also been observed following treatments incorporating self-monitoring of on-task responding (Wood et al., 1998).

Communication Skills

Communication skills are crucial in both the academic and social aspects of the child’s environment (Thatcher, Fletcher & Decker, 2008). Communication can assist children with several essential functions, such as developing prosocial peer relationships, accessing help on difficult academic work, and soliciting
acknowledgment for effort and performance (Durand & Carr, 1991). As a result of communication difficulties, children with behavioral difficulties often rely on problem responding to express their wants and needs (Carr & Durand, 1985).

An association between communication difficulties and aberrant behavior has often been noted (Bott, Farmer, & Rohde, 1997; Carr & Durand, 1985; Schroeder, Schroeder, Smith, & Dalldorf, 1978). For example, in a study conducted in a state facility for persons with developmental disabilities, Schroeder et al. (1978) reported that 63% of individuals with severe self-injurious behavior and 72% of those with mild self-injurious behavior were found to have no expressive language. Bott et al. (1997) found that across 3,662 individuals with learning disabilities, those with more developed speech skills demonstrated a lower frequency of challenging behaviors than those with impaired speech skills. In a longitudinal study involving 13 children with developmental disabilities, Sigafoos (2000) investigated the association between communication development and problem behavior. Child communication skills and severity of problem behaviors were assessed every 6 months over a period of 3 years. Results provided support for the hypothesis that impaired development of communication skills plays a key role in the emergence of problem behavior.

As noted earlier, communication and problem behavior appear to comprise a response class (Langdon et al., 2008; Carr & Durand, 1985), allowing children access to similar outcomes and suggesting the keystone potential of teaching communication skills (Barnett et al., 1996). Much problem behavior can be viewed as adaptive, allowing individuals to endure challenging environments (Kevan, 2003) and serving as an alternative means of communication (Carr & Durand, 1985). Given the inability of some children with skill deficits to verbally convey needs when subjected to stress or discomfort (e.g., pain, frustration, hunger, fatigue), they may engage in disruptive behavior that provides them with access to the outcome being sought (e.g., attention, termination of demands, tangible or edible items). In such cases, teaching a functionally equivalent communicative response as a prosocial alternative could provide the individual with a more efficient means for accessing the desired outcome, thereby rendering the problem behavior unnecessary (Carr et al., 1994).

Functional communication training (FCT), which has received extensive empirical support in the clinical research literature, is an intervention designed to reduce challenging behavior through the training of functional communicative responses (Carr & Durand, 1985; Durand and Carr, 1991). Carr and Durand (1985) introduced FCT as an approach for the treatment of problem behavior in children with developmental disabilities. Following a functional assessment, each child in the study was taught responses that matched and responses that did not match the assessed function of their problem behavior. Problem behavior decreased only when the matching functional response was taught. Participants were then taught to verbally request attention, assistance, or both, and were reinforced when they successfully did so. When functionally relevant consequences were delivered following appropriate communicative behavior, reductions in aberrant behavior and increases in appropriate communication occurred.

Durand and Crimmins (1987) used FCT to decrease unusual speech and disruptive behavior in a boy with developmental disabilities. The reductions occurred only when communicative behaviors were taught that matched the function of the problem behaviors. Day, Horner, and O’Neill (1994) and Braithwaite and Richdale (2000) investigated FCT in combination with extinction for problem responses with children whose problem behavior served multiple functions. In both studies, problem behavior decreased after multiple communicative responses were taught that matched each of the outcomes being sought. Durand and Carr (1991, 1992) provided further evidence for the functionally equivalent relationship between communication and aberrant behavior, and demonstrated that the collateral effects of intervention can
be transferred across new tasks, environments, and teachers, as well as maintained over time. The use of FCT as investigated in the studies just mentioned required a formal functional assessment to determine the functions of child problem behavior and the specific communicative behaviors to teach as a replacement. However, the extensive data showing an association between communicative abilities and reduced problem behavior suggests that teaching communication skills, even without functional analysis, should be an essential component of effective classroom management. It is likely that the simple focus on prompting and reinforcing children for using their words (or other prosocial communicative strategies) as a means of getting their wants and needs met has the potential to serve a keystone role for behavioral remediation, providing broad-ranging positive change in student outcomes.

**Educational Implications**

Considering the constraints on teachers’ time and the budgetary restrictions of school boards, comprehensive and time-consuming interventions are not practical or realistic for teacher use. Alternatively, there may be some potential for the incorporation into routine teacher practices of keystone strategies that lend themselves to use with multiple students and a wide range of problem responses, a significant advantage when the teacher is required to deal with several children in one class with serious behavioral issues. Given the increased number of children with emotional and behavioral disorders in today’s mainstream schools, the keystone approach may provide a promising means of increasing the practicality and efficiency of classroom management.

Training in keystone strategies could also provide teachers with the resources to prevent problem behavior and manage disruptions without the use of reactive consequences. As students experience success in the use of keystone skills, teachers could devote much more time to instructional activities rather than on reactions to problem responses that rarely contribute to positive long-term outcomes. This would allow teachers to avoid all of the well-documented drawbacks of punishment and reactive approaches.

The keystone approach to classwide management requires teachers to scaffold students with behavioral difficulties in the keystone skill areas: compliance, social skills (including the subskill of acquiescence), on-task skills, and communication. By focusing on prompting students to success in these areas, reinforcing their prosocial responses to this support, and gradually reducing the scaffolds while increasing behavioral expectations, teachers can provide students with a solid foundation of skills that will render a large proportion of problem responses unnecessary. For example, to build greater child compliance, teachers can start by delivering a higher proportion of high probability requests (i.e., those that are highly likely to yield compliance, e.g., “help me clean the blackboard”), especially to students who have trouble adhering to classroom requirements. Teachers can praise compliance to such simple requests and then gradually increase the difficulty of demands (as in ECT; Ducharme, 2007) or reduce the frequency of the high-probability requests (e.g., Ducharme & Worling, 1994), with continued praise for cooperative responding to these more challenging requests.

Similarly, students with interaction difficulties and aggression with peers could be encouraged to acquiesce (i.e., give in to the will of others) when it is essential to do so (Ducharme et al., 2008). For example, after prompting a child to ask a more aggressive student to share a toy during playtime, the teacher could scaffold the aggressive child by saying “That was nice the way Tristan asked you for that toy—could you show him how nice you are by sharing it?” Given the prompts and proximity of the teacher, the sharing response would be much more likely to occur, providing the teacher with an opportunity to reinforce the child’s cooperative success. Eventually the teacher could fade prompting and reinforcement for such scaffolded responses and focus on more challenging and less supported responses.
With regard to on-task skills, teachers could provide prompt support to the child to ensure successful completion of the first couple of questions on a test, with accompanying praise for correct responding. The teacher could then leave the child to deal with the needs of other students while providing an instruction like the following: “That was great work! Now, can you show me how well you can keep going without my help? I’ll be back in a few minutes to see how you’re doing.” The teacher could then work with other students before returning after a short time to the one who needed the help. In our own classroom research, we have found that most children that we have treated, including those with severe oppositional behavior, are excited by their initial successes in the presence of the teacher, and therefore motivated to continue working while the teacher is away. Upon return, the teacher can praise the on-task efforts with a statement such as “That was amazing—you kept working the whole time I was away!” Over time the teacher can gradually increase the amount of time spent away from the student before returning to reinforce on-task behavior, thereby systematically building the student’s tolerance for remaining on task (see Ducharme & Harris, 2004).

Finally, communication skills can be encouraged with a broad range of strategies that focus on prompting children to express their wants and needs. For example, the teacher could make an announcement to all students at the beginning of an assignment that he will provide help to anyone who asks for it by raising a hand. He might then approach and quietly prompt a student who is known to become frustrated with her work, by saying, “Matisse, would you like to raise your hand? I’d be very happy to help you get started.” The teacher could then praise the child for seeking help by raising her hand, thereby increasing the future likelihood of such communication and reducing the probability of frustration-related problem behavior.

These are just a few examples of a range of potential procedures for inclusion in a keystone training package. The use of similar prompt, reinforce, and fade procedures with the various facets of each of the keystone skills would provide teachers with a proactive strategy for improving foundational student skills that would likely lead to broader positive outcomes and student well-being. The approach would allow teachers to prevent classroom problem behavior rather than reacting to it once students begin to act out. Although research is required to confirm the possibility, the keystone approach might be more practical than strategies that require systematic assessment of contextual variables and individualized intervention for each problem response that arises. Thus, the keystone approach could potentially provide an alternative to classroom management that addresses many of the concerns presented by approaches that have been demonstrated effective in clinical settings but have yet to find a comfortable footing in education.

Although all of the research presented in this article adds support to the feasibility of the keystone approach, the research in our lab is particularly corroborative. We have conducted studies that involved training teachers (e.g., De Sa Maini & Ducharme, 2011; Ducharme, Dipadova, & Ashworth, 2010; Ducharme & Ng, 2011), classroom support staff (e.g., Ducharme & Ng, 2011; Ducharme et al., 2008; Ducharme & Harris, 2005), and parents (e.g., Ducharme et al., 2000; Ducharme, Popynick, Pontes, & Steele, 1996) to successfully conduct interventions for a wide range of children with significant behavioral challenges. In each of these studies, intervention agents focused on specific keystone skills and produced a broad range of covariant improvements and generalized effects.

Although more data are required, current evidence suggests that the keystone approach can be a cost-effective strategy for improving classroom outcomes. We have conducted studies demonstrating that intervention agents can be taught the skills required to conduct keystone interventions in 4–6 hr of training. In a recent study (De Sa Maini & Ducharme, 2011), we trained 16 teachers in proactive classroom management that included key elements of the keystone approach. In this investigation, the training workshop
was 4 hr long and resulted in substantial improvements in teacher skills and student behavioral outcomes, including increases in student prosocial responding and substantial reductions in student disruptive and off-task behavior. Moreover, those responsible for implementing the interventions (e.g., parents, teachers) were pleased with the approach and the support they received.

**Summary and Future Directions**

This review discusses the need for an effective, practical intervention approach to treatment of disruptive student behavior in the classroom. The training that teachers receive before entering the classroom often does not adequately prepare them for the behavioral challenges they are likely to face. As a result, teachers may experience high levels of stress and low self-efficacy in their efforts to manage student behavior. Reactive approaches are the most commonly used by teachers for dealing with problem responses and these strategies may result in short-term reductions of problem behavior, but often at the cost of long-term child well-being.

Considering the disadvantages and negative side effects of reactive approaches, research has increasingly promoted the use of more proactive methods to manage student problem behavior, particularly those involving functional assessment. However, despite its extensive and effective use in research and clinical circles, functional assessment is not commonly accepted or adequately practiced by teachers in the classroom, possibly because of the expertise and time required to use this approach effectively.

A focus on keystone skills may address many of the challenges associated with use of functional analysis in the classroom. Given that several research studies have demonstrated that modification of keystone behaviors leads to collateral improvements in a range of other behaviors, use of this approach as a general instructional and interactional strategy could feasibly allow teachers to manage multiple problem responses simultaneously. In addition, a keystone approach is designed to be employed without formal assessment of maintaining variables, potentially rendering classroom intervention significantly less time-consuming and complicated than many forms of functional assessment and enabling the use of the approach on a classwide rather than individual level.

Although keystone intervention could potentially render classroom functional assessment unnecessary, the keystone skills proposed in this article may be those that would most commonly be derived for intervention after systematic functional assessment. The skills used likely serve the same role in the keystone approach—that is, as functional replacement behaviors that belong to the same response class as problem behaviors and reduce such responding by providing the child with more effective and efficient tactics for dealing with classroom challenges. Thus, keystone intervention may well be a “functional” approach to managing problem behavior, although with a substantially paired down procedural protocol.

Much research is required to substantiate the efficacy of the keystone model to classroom management presented in this article. The first step involves development of a circumscribed skill set for conveyance to teachers during staff training workshops. The teacher curriculum must include a range of simple strategies for building the keystone skills (including techniques like those cited in the examples presented earlier) during naturally occurring daily classroom activities and interactions.

Once the workshop content is developed, classroom-based research studies documenting the use of this approach in general as well as specialized classrooms (for children with learning needs or challenging behaviors) should be conducted. Researchers could then evaluate the effects of the teacher training on the behavior of teachers as well as on the responses of their students (De Sa Maini & Ducharme, 2011). Such studies would require measurement not only of core student skills being targeted, but of problem behaviors that may interfere with student success or untargeted prosocial behaviors that might serve as
indicators of student well-being and progress (see Ducharme et al., 2008, for an example of the covariant measurement required). Moreover, research in this area should focus on systematically evaluating the cost-efficiency of the approach and the perception of both teachers and psycho-educational staff (those who may be involved in teacher training and support) of the practicality and acceptability of the approach.

In summary, conceptual and empirical considerations suggest that the keyston approach holds much potential as a practical strategy for proactive classroom management. However, much work needs to be done before conclusions can be drawn about its promise for the field of education and its capability of providing a more practical alternative to strategies that are currently used or recommended, including those based on functional assessment models.

References


Lee, S., Odom, S. L., & Loftin, R. (2007). Social engagement with peers and stereotypic behavior of children...


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Joseph M. Ducharme is an associate professor in the School and Clinical Child Psychology Program, Ontario Institute for Studies in Education, University of Toronto. He does research on proactive clinical and educational interventions for children.

Carly Shecter is a doctoral graduate student in the School and Clinical Child Psychology Program, Ontario Institute for Studies in Education, University of Toronto. She is interested in assessment and intervention for children and adolescents.