Keystone Classroom Management: A Practical Approach to Producing Widespread Change in Student Behaviour

by

Carly Shecter

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Graduate Department of Human Development and Applied Psychology
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Many researchers have pointed out the difficulties teachers face with managing student oppositional behaviour in the classroom. Most pre-service teacher education programs emphasize the curriculum content and the planning of lessons to the exclusion of specialized training in classroom management approaches. This oversight has led to inadequate classroom management skills in many teachers and can result in low teacher self-efficacy and high rates of stress and burnout. Many commonly employed strategies used by teachers to manage problem behaviour focus on reductive consequences that can have a range of negative side effects. Other strategies may be proactive and effective, but are often too complicated and impractical for regular use. In this paper we propose a "keystone" approach to classroom management that may be more efficient and effective for teachers to use in the classroom. With this approach, teachers focus on a circumscribed set of specific classroom skills that have the potential to produce widespread improvement in child outcomes. Empirical support for this approach is discussed.

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Table Contents

Estimates indicate that between 12 to 22 percent of children in school suffer from a mental, emotional, or behavioural disorder (Adelman & Taylor, 2002). The Association of School Counselors states that 18 percent of students have special needs and require interventions intensive enough to go beyond the resources typically available in a classroom (Dunn & Baker, 2002). Research studies estimate prevalence rates of children with diagnosable mental disorders as up to 36 percent (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005), however, only a small proportion actually receive intervention or treatment services (Pastor & Reuben, 2002).

Until the last decade, most Canadian students with emotional and behavioural disorders (EBD) were segregated from their non-disabled peers and placed in independent special-education contexts. Whether in separate schools or in separate classrooms within regular schools, these classes were designed to meet the special needs of individual students. More recently, policymakers have adopted a philosophy of inclusion, encouraging schools to integrate students with disabilities in mainstream educational classrooms (Uppal, Kohen, & Khan, 2008). According to the 2001 Participation and Activity Limitation Survey (PALS) of over 8,000 Canadian children, approximately 60% of students with disabilities are educated in regular classrooms (Behnia & Duclos, 2003). With the integration of these children in mainstream settings, a large proportion of general education teachers have become instrumental in providing support and intervention services to students with a wide range of instructional needs.

Considering the number of children with special needs in regular classrooms, it is not surprising that child problem behaviour is one of the largest concerns facing educators in the classroom (Merrett & Wheldall, 1993; Lewis, Romi, Qui, & Katz, 2005; Wheldall, 1991). Not only do behavioural difficulties impede the ability of these youngsters to learn new material and develop important skills, but they can prevent the teacher from teaching and running the

classroom effectively. Instead of focusing more intensively on the curriculum, general education teachers who have challenging students are required to direct much time and attention towards behavioural issues (De Martini-Scully, Bray, & Kehle, 2000).

As part of their expected duties, teachers must demonstrate knowledge and skill in assessing students' academic and social needs, and developing a curriculum that allows all students to gain from the teaching provided. However, the inclusion of students with EBD creates increased challenges that amplify the demands placed on teachers to develop effective and efficient classroom management strategies and interventions. As Zeidner (1988) states:

> Adequate classroom discipline is generally regarded to be one of the most essential aspects of education as well as an absolute prerequisite to achieving instructional objectives and safeguarding students' psychological, social and physical well-being. As experts have pointed out the relatively rudimentary stage of the science of classroom discipline may account for the often inadequate preparation of teachers in classroom control techniques and the consequent difficulties in implementing these strategies in the classroom (p. 69).

Inadequate Teacher Training

Despite the importance of effective behaviour management by teachers, most pre-service teacher education programs focus mainly on the content of syllabuses and the planning of lessons to the exclusion of intensive training in classroom management approaches (Merrett & Wheldall, 1993). According to the Ontario College of Teachers (1999), teacher colleges should make available in-service training that provides teachers with the skills and understanding to work effectively in an inclusive environment supporting children with special needs. However, as per a survey sample of 1,000 teachers in Ontario (Ontario College of Teachers, 2007), the quality of Ontario's training of teachers is less than satisfactory. In this survey, Ontario teachers expressed

concern that the training they receive is inadequate in preparing them for the demands of a typical classroom. Further, classroom management was judged to be one of the top five concerns among the teachers surveyed (Ontario College of Teachers, 2007). In another report entitled, "Preparing teachers for tomorrow: The final report", the Council of the Ontario College of Teachers (2006) made 66 recommendations about Ontario's initial and continuing courses and programs of professional education. One of the recommendations for new policy directions regarding the regulation of teachers' qualifications in Ontario proposes a need "to adjust the content of the program of professional education to identify special education as a required component within the program of professional education" (p.101).

In a survey sample of 96 teachers of students with EBD from the United States, approximately two-thirds lamented that their college education did not adequately equip them to teach children with severe behaviour problems (George, George, Gersten, & Grosenick, 1995). In another American study, twenty third- and fourth- grade teachers were interviewed with respect to the methods they use, or could use to deal with difficult-to-teach students (Wilson, Gutkin, Hagen, & Oats, 1998). Approximately half of these teachers were unable to adequately describe strategies and interventions that could be used effectively to manage problem behaviour.

In Australia, the government of Victoria recently released the final report of its inquiry into the suitability of pre-service teacher education (Parliament of Victoria, 2005). This comprehensive review sought to determine the range and nature of pre-service teacher education courses to identify how these courses were perceived to meet the needs of teachers and education systems for the 21st century. The report revealed that teacher education courses do not provide student teachers with sufficient experience of the practical challenges of functioning in a school environment, including managing student behaviour. In another Australian study, Martin,

Linfoot, and Stephenson (1999) interviewed 130 primary school teachers, most of whom felt they were particularly in need of information designed to deal with student misbehaviour. The majority of teachers also reported serious interest in receiving information regarding positive behaviour instruction, school resources and teacher responsibilities. According to the authors, these findings indicated that teacher education is not adequately equipping teachers with the skills necessary for effective behaviour management.

Teachers' feelings of inadequacy with regards to their skills and knowledge of behaviour management and the inclusion of children with disabilities in the classroom were also found in another study conducted in England (Merrett & Wheldall, 1993). In this survey of 126 secondary school teachers, respondents reported that classroom management skills were of major importance to them professionally, but approximately one-third felt that they had not received sufficient training in this area**.** Additionally, 82 percent of the teachers stated that they were forced to learn how to manage student behaviour problems during their first few years in the classroom and 85 percent reported that additional training would likely decrease the frequency of student misbehaviours in the classroom (Merret & Wheldell, 1993). What appears to be universal is that most teachers feel unprepared to manage their students' misbehaviours.

Teacher Stress and Burnout

Given that surveys repeatedly document teacher concerns regarding inadequate classroom management skills, it is not surprising that teachers' difficulties managing student behaviour problems constitutes a large source of stress (Geving, 2007; Hastings & Bham, 2003). Researchers note that teachers who endure stress over extended periods of time may experience what is known as burnout (Borg, Riding, & Falzon, 1991; Brackenreed & Barnett, 2006; Friedman, 1995; Troman & Woods, 2001), when they evidence feelings of emotional exhaustion, attitudes that tend to depersonalize students, and low levels of personal accomplishment in their

work (Burke, Greenglass, & Schwarzer, 1996; Friedman, 2000; Hastings & Bham, 2003; Schwarzer & Hallum, 2008).

Numerous factors have been recognized as sources of stress for teachers. These include curriculum demand and workload, resource constraints, poor professional relationships with colleagues, inadequate salary, role conflict, student misbehaviour, time management, difficult interactions with parents, and the expectations and lack of recognition from other staff (Borg et al., 1991; Boyle, Borg, Falzon, & Baglioni, 1995; Chaplain, 1995; Pithers & Soden, 1998).

Although there are several variables contributing to prolonged teacher stress, student misbehaviour has frequently been reported as one of the major contributors across many studies. For example, Griffith, Steptoe, and Cropley (1999) examined job stress in 780 primary and secondary school teachers in Britain and discovered that the two main sources of stress were work pressure and student misbehaviour. Ingersoll (2001) studied 6700 teachers and found that about 30 percent of the approximately 400 who chose to leave the profession identified student discipline as one of the reasons they gave up teaching. Additionally, Salo (1995) interviewed 66 teachers across elementary schools, junior high schools and high schools in Finland and found that 49 percent of the teachers reported that student misbehaviours were the most stressful aspect of teaching.

In their work in developing a model of teacher burnout, Burke, Greenglass, and Schwarzer (1996) found that difficulties managing disruptive students significantly predicted teachers' level of burnout near the end of the school year. The researchers used the Maslach Burnout Inventory (MBI) developed by Maslach and Jackson (1986), which is currently the most widely used research instrument in the area. They found that in a sample of 362 Canadian teachers, teacher difficulties managing misbehaving students was the best predictor of burnout one year later for female teachers. Moreover, emotional exhaustion turned out to be a key facet for teacher

burnout.

Using an adapted version of the MBI with 348 Israeli teachers, Friedman (1995) investigated the differential relationships between the dimensions of burnout, as well as the dimensions of student behaviour. To determine which unique student behaviour patterns contribute to burnout among teachers, he also developed the Pupil Behaviour Patterns (PBP) scale. Findings indicated that student behaviour patterns, disrespect, sociability (the degree of closeness between the teacher and student) and inattentiveness made a significant contribution to the probability of teacher burnout. As predicted by the researchers, the highest contribution was made by student disrespect.

Almost a decade later in the United Kingdom, Hastings and Bham (2003) conducted a similar analysis to Friedman (1995)'s first study, using the MBI and PBP. Based on their sample of 100 primary and secondary school teachers, the researchers also found that disrespectful student behaviour predicted emotional exhaustion. Results of both studies suggest that the cumulative effects of student misbehaviour lead to stress and burnout for teachers.

Teacher burnout can have a significant impact on the strategies used to manage student misbehaviour in the classroom. Research demonstrates that teachers' interactions with their students are negatively affected by their stress level, such that they tend to use harsher discipline and spend less time engaging students in a positive manner (Capel, 1992). Clunies-Ross, Little, and Kienhuis (2008) surveyed 97 teachers and observed 20 of them in their classrooms. They found that increased stress in teachers was associated with greater use of reactive strategies. Furthermore, a significant negative correlation was found between the reported use of reactive strategies and student on-task behaviour, suggesting that reactive discipline strategies hinder a child's ability to engage in course material and learn the curriculum.

Teacher Self-Efficacy and Burnout

Current research suggests that teacher self-efficacy and confidence in their ability to manage student behaviour are important factors in the prediction of teacher burnout. Self-efficacy has been associated with adaptive functioning and power over one's environment (Bandura, 1997), and has been proposed as a potentially critical component of teacher success (Martin, Linfoot, & Stephenson, 1999). Teacher self-efficacy has been defined as "teachers' belief or conviction that they can influence how well students learn, even those who may be difficult or unmotivated" (Guskey & Passaro, 1994, p. 4).

Numerous studies have found relationships between teacher self-concept variables and teacher burnout (Chwalisz, Altmaier & Russell, 1992; Friedman & Farber, 1992; Martin, Linfoot, & Stephenson, 1999; Tuettemann, & Punch, 1992). Furthermore, the discrepancy between teachers' expectations of successful professional performance when in teachers' college and their actual, less satisfying teaching experience after being hired by a school board emerges as highly predictive of burnout (Friedman, 2000; Friedman & Faber, 1992). Teachers may believe they are well prepared and capable when leaving training, but quickly realize they are not adequately equipped to adapt to the numerous challenges that come with being a teacher (Friedman, 2000).

Teacher sense of efficacy also has been related to the strategies teachers use in the classroom. Researchers examining the relationship between teacher efficacy and teacher practices have concluded that teachers who feel confident in their ability to teach students with behaviour difficulties are more likely to engage in effective instructional practices than are colleagues with lower self-efficacy beliefs (Bender & Ikechukwu, 1989).

Gibson and Dembo (1984) found differences in the classroom behaviour of low- and high self-efficacy teachers. Specifically, they found that teachers with high self-efficacy were more likely to use positive reinforcement and less likely to use reactive strategies with misbehaving

students, while teachers low in self-efficacy were more likely to use reactive strategies and less likely to use positive reinforcement. Additionally, in comparison to teachers with low self-efficacy, teachers with high self-efficacy tend to be more responsive to disruptive students (Gibson & Dembo, 1984), exhibit less anger towards problem behaviours (Yoon, 2002), and are more willing to integrate students receiving special education services for behaviour problems in their classrooms (Brownwell & Pajares, 1999).

Summary

Together, teachers' perceived competence, stress levels and the adequacy of the training they receive may have critical implications for their behaviour in the classroom and towards their students. It is evident from the research literature that student problem behaviour, teacher burnout, teacher self-efficacy and the use of ineffective or reactive classroom management strategies are closely interconnected. That is, student misbehaviours and a teacher's inability to manage them can compromise a teacher's feelings of self-efficacy in classroom management and lead to teacher burnout. Teacher burnout contributes to a higher use of harsh disciplinary strategies, which in turn leads to decreased student on-task behaviour, further reducing the level of teacher self-efficacy (Brouwers & Tomic, 1998). Based on these findings, it is likely that if teachers were adequately trained in classroom management strategies, student misbehaviours would be significantly reduced, decreasing teacher stress and increasing teacher self-confidence in their ability to manage behavioural challenges. This could feasibly result in enhanced motivation to use effective classroom management strategies even more consistently, thereby engendering even lower levels of student behaviour problems (Geving, 2007; Hastings & Brown, 2002; Kellam, Ling, Merisca, Brown, & Ialongo, 1998). Thus, the primary means for ensuring effective management of student problem behaviour, reduction of teacher stress and enhancement of teacher self-efficacy may involve thorough teacher training in the use of

effective classroom management practices.

Classroom Management Strategies

Classroom management refers to teachers' management of student behaviour to construct a classroom atmosphere that fosters the development of effective teaching and child learning (Brophy, 1986). Effective classroom management strategies have been shown to greatly influence student achievement (Wang, Haertel, & Walberg, 1993), student attitudes towards schoolwork (Lewis, Romi, Katz, & Qui, 2008), student social competence (Webster-Stratton, Reid, & Stoolmiller, 2008) and student emotional and behavioural functioning (Piko, Fitzpatrick & Wright, 2005).

Reactive Classroom Management Strategies. A substantial body of literature demonstrates a shift over the past few decades from research documenting consequence- focused interventions for reducing problem behaviour to more proactive, positive strategies emphasizing the building of prosocial child behaviours (Ducharme, 2007a; Stage & Quiroz, 1997). However, despite evidence for the effectiveness of proactive strategies, research suggests that a large proportion of teachers use strategies that employ reactive/punitive means to manage student misbehaviour (Infantino & Little, 2005; Maag, 2001).

For example, Poulou and Norwich (2000) discovered that although teachers in Greece reported preferring the use of positive reinforcement in the classroom, observations indicated that they were more likely to use punishments or threats. Using a behavioural observation schedule to study how teachers reacted to student behaviour, Merrett and Wheldall (1986) found that teachers often respond negatively, using high levels of reprimands. In fact, for inappropriate social behaviours, negative responses were three times as frequent as positive responses among secondary school teachers. This study is consistent with more recent research findings demonstrating that teachers use predominantly positive responses for academic behaviours and

negative responses for problematic social behaviours (Beaman & Wheldall, 2000; Clunies-Ross et al., 2008). Little and Akin-Little (2008) surveyed 146 teachers about the classroom management strategies they employ to deal with disruptive student behaviour and the majority of teachers reported using a verbal reprimand (83%), moving the student closer to the teacher (83%), and a "long stare" noting disapproval with behaviour (80%). Low frequency of praise and high rates of disapproval from teachers have also been observed in Australian primary school classrooms (Martin, Linfoot, & Stephenson, 1999**).**

Studies have shown that teachers often tend towards use of reactive strategies, those that involve presentation of an aversive consequence contingent on a problem response, because it may best achieve their short-term objective of immediately stopping the problem behaviour (Beyda, Zentall, & Ferko, 2002; Hall & Hall, 2003). The rapid termination of student problem behaviour is an important consideration for teachers as it helps prevent the potential disruptive effects that the student's misbehaviour may have on other children. Furthermore, most reactive strategies are typically quick and easy to administer (Bear, 1998; Maag, 2001). They also appear to mesh with the instinctive reactions of authority figures, who tend to react strongly to behaviours that are potentially disruptive or harmful to classroom occupants and routines.

Notwithstanding these advantages, there are many concerns with use of punishment and reactive strategies in the classroom. First, the use of some reactive strategies may result in the inadvertent reinforcement of problem behaviour, thereby increasing the probability of the misbehaviour reoccurring in the future (Maag, 2001). For example, the delivery of a reprimand to a child who is seeking attention with his problem behaviour may result in the child receiving exactly what she desires. Similarly, administering a time-out consequence to a child who is trying to avoid the challenging demands of the classroom may provide him with the escape he was seeking (Gunter, Denny, Jack, Shores, & Nelson, 1993; Turner & Watson, 1999).

Patterson (1975, as cited by Maag, 2001) described a phenomenon, called the negative reinforcement trap, which helps explain the reinforcing cycle of teacher reactivity and student misbehaviour. To illustrate, a student who engages in disruptive behaviour because he finds the classroom assignment too difficult may be sent out of the classroom as a consequence of his misbehaviour. Considering that the student's dismissal terminated the unpleasantness of his disruptions for the teacher, the teacher's use of time-out is reinforced and the teacher will likely use this strategy in the future to bring about a positive change in the classroom atmosphere. From the perspective of the student who lacked the necessary skills for completing the given assignment, being removed from the classroom likely provided relief from the aversiveness of the classroom situation. This desired outcome therefore ensured that problem behaviour would recur in the future to allow the child to escape his difficult circumstances. Thus, teachers are often reinforced for being reactive with students and the students are often inadvertently reinforced for classroom misbehaviour. This reinforcement trap is likely to lead to continued behavioural breakdowns in the classroom rather than improved child responding over time.

Although reactive strategies may provide the teacher with a short-term solution to unwanted behaviour, such procedures rarely produce long-term results because they fail to teach children a more prosocial alternative to problem responses (Hall & Hall, 2003). Furthermore, children's problem behaviours are often an adaptation to challenging environments that they are unable to manage on their own (Ducharme & Harris, 2005). Teacher use of negative consequences to suppress the adaptive responses without targeting the variables maintaining the behaviour will likely fail to provide durable behavioural improvements. If students are not taught more effective ways of coping with difficult circumstances, they will continue to rely on maladaptive behaviours to manage adversity (Ducharme, 2007a).

Proactive Classroom Management Strategies and Functional Analysis. Given the negative

side effects of reactive and punitive disciplinary procedures, positive and proactive forms of classroom management have been the central focus in current education research, although many of the strategies have been noted in the literature for almost forty years. In a famous study by Kounin (1970), the main factor that distinguished effective from ineffective teachers was the use of preventive rather than reactive strategies for classroom management. Sanford, Emmer, and Clements (1983) stated that proactive approaches to behaviour management emphasize student involvement and cooperation in classroom activities, as well as creating a positive working environment. Gettinger (1988) described three features that distinguish proactive strategies from other approaches. First, proactive strategies are by definition preventive in that the goal is to discourage the occurrence of problem behaviours before they occur**.** Second, the teacher facilitates learning and manages the class by focusing primarily on the students' achievement and development of academic skills. Third, group components of classroom management are promoted instead of emphasizing individual student behaviour.

Building on this earlier work, more recent research has demonstrated the significance of a range of proactive approaches for prevention and management of student discipline problems and the creation of a positive classroom climate (e.g., Ducharme, 2007a; Kern & Clemens, 2007). One such approach involves the use of "antecedent" strategies, those that entail simple manipulations of conditions that may immediately precede problem situations. Through the presentation of stimulus conditions associated with a greater probability of desirable student responding (e.g., prompts for difficult questions), and the elimination of conditions associated with problem behaviour (e.g., removal of distracting toys from the circle area of a kindergarten class), antecedent strategies in the classroom can create an environment that encourages student success and prosocial responding (Witt, VanDerHeyden, & Gilbertson, 2004). Kern and Clemens (2007) provide a general summary of how antecedent interventions can be employed to

effectively prevent maladaptive behaviour, create a structured classroom setting, and improve student motivation. These authors discuss a range of interventions at both the class-wide and individual levels that are quick acting and preventative. For example, in a class where some students have difficulty transitioning between tasks, teachers can provide a warning about an upcoming transition that will prepare the students for change, and thus reduce the likelihood of misbehaviour when the transition takes place.

Although antecedent strategies can be extremely beneficial in the short term, they often do not provide enduring changes in student behaviour (Ducharme, 2007a). Thus, other approaches may be necessary for long-term improvements. One such strategy involves the use of functional analysis, a means of determining the function, or purpose, of specific child problem behaviours within the classroom environment (Witt, Daly, & Noell, 2000). Functional analysis is also beneficial in isolating the antecedent conditions that require modification (e.g., Butler & Luiselli, 2007), thereby enabling effective use of the antecedent approaches described earlier. Functional analysis is the state of the art for treatment using applied behaviour analysis and has become one of the most commonly recommended approaches for intervention with problem behaviour in the clinical and education literature (Hanley, Iwata, & McCord, 2003).

According to Dunlap et al. (1993), functional analysis involves a three-step procedure. First, a number of hypotheses are generated regarding the purpose the problem behaviour serves and the environmental variables maintaining it. Next, the environmental variables are systematically manipulated in order to test the hypothesized function of the problem behaviour. For example, if a student's disruptive behaviour is hypothesized to serve an escape function during difficult tasks, then the approach might be to determine the effect of reduced demands on the misbehaviour. If the disruptive behaviour decreases under these altered circumstances, task demands can be reintroduced to further test the hypothesis. Finally, once a relationship between

the problem behaviour, antecedents and behavioural outcomes is verified, an intervention is developed to modify the environment, often by teaching the student a prosocial replacement behaviour that serves the same function as the problem behaviour (e.g., appropriate strategies for requesting attention, help, or a break from a difficult task). Such a skill building strategy renders the problem behaviour unnecessary, as the students then have a prosocial response that will provide him/her with access to the same outcome that was being sought with the problem response.

Additionally, the treatment provider using functional analysis can incorporate 'extinction' strategies into the intervention to ensure that the problem behaviour no longer continues to provide access to desired outcomes for the child (Ducharme & Van Houten, 1994; Dunlap et al., 1993). Thus, teachers could be taught to provide few reactions to child problem behaviours when the functional analysis indicates that the function of the behaviour is attention; similarly they could ensure that the child is not sent out of the room when the function of the behaviour is escape from demand (Iwata et al., 1994).

Even though a problem behaviour may appear alike for different students, the response can serve different functions and be maintained by very different outcomes (Vollmer & Northup, 1996). For example, one student may display aggressive behaviours that are maintained by attention, while another may display a similar behaviour that is maintained by escape from instructional tasks. Correct identification of the relevant outcomes of a problem behaviour can be crucial to the development of effective behavioural treatments. As noted in the examples above, the most common consequences that reinforce problem behaviour are attention, and escape from aversive tasks (Lewis & Sugai, 1996; Mace, Lalli, & Pinter-Lalli, 1991; Northup et al., 1994). Each is readily available in the classroom and each has been shown to reinforce both appropriate and inappropriate behaviour for some students and not for others (Vollmer & Northup, 1996).

Functional analysis is viewed as an essential component of proactive classroom management (Hanley, Iwata, & McCord, 2003). In fact, Gresham and colleagues reviewed 150 school-based intervention studies conducted with children and published in the Journal of Applied Behavior Analysis from 1991-1999, and approximately half of the studies reviewed used functional analysis (Gresham et al., 2004). The functional analysis model of assessment and treatment has been modified and extended to a range of contexts and populations. For instance, functional analysis has been effectively used in the treatment of individuals with self-injurious behaviour (Iwata et al., 1994; Lalli, Browder, Mace, & Brown, 1993; Watson, Ray, Turner, & Logan, 1999), aggression (Borrero, Vollmer, & Borrero, 2004; Mace, Lalli, & Pinter-Lalli, 1991), disruptive behaviour (Broussard, & Northup, 1995; Packenham, Shute, & Reid, 2004), vocal tics (Carr, Taylor, Wallander, & Reiss, 1996), stereotypy (Johnson, Van Laarhoven, & Repp, 2002), pica (Piazza, Hanley, & Fisher, 1996), hair pulling (Miltenberger, Long, Rapp, Lumley, & Elliot, 1998), and tantrums (Vollmer et al., 1996).

Despite the widespread use of this well-developed technology in clinical and educational intervention research and its proven effectiveness with a variety of samples, functional analysis is not widely accepted or sufficiently practiced by teachers in the classroom (Gresham, 2004). Thus, there appears to be a substantial gap between classroom intervention research and practice. Some researchers have suggested that teachers' resistance may be due to the complexity of functional analysis, the time and special expertise it requires, and the applicability of the approach to natural environments (Northup et al., 1994; Sasso et al., 1992). Although the contexts in which functional analyses are conducted may vary (e.g., lab, clinic, school, hospital, etc.), many of those documented in published journal articles are conducted under highly-controlled conditions that may not approximate the everyday circumstances surrounding the natural occurrence of the problem behaviours.

One of the main advantages of functional analysis in a clinical setting is the clear determination of key controlling variables for problem behaviour, often gained through experimental control of environmental conditions. However, the degree of control required to execute an effective analysis may limit the ecological validity of the results (Carr, Yarbrough, & Langdon, 1997). The success of a functional analysis in determining the motivation of a behaviour depends, in part, upon ensuring that any experimental manipulations made occur under conditions similar to those that occur naturally in the everyday environment of the child (Carr, 1994). There is no guarantee that the variables that trigger and maintain the behaviour in a clinical or analogue environment are the same as those in the natural environment (Taylor & Romanczyk, 1994).

Even when functional analysis is conducted in natural environments, many potential barriers exist. A few studies have shown that functional analysis can be employed in the school setting (e.g., Packenham, Shute, & Reid, 2004). However, given the extensive assessment and systematic manipulation required in functional analysis, it is often an impractical and time-consuming procedure. Dunlap et al. (1996) reported that implementation of functional analysis procedures required from 13 to 18 sessions, and Broussard and Northup (1995) required two to five 10-minute sessions per day over a period of 12 to 16 days. Although in many studies (e.g., Lewis & Sugai, 1996; Packenham, Shute & Reid, 2004) the functional analysis was completed in a more timely manner, they still typically reported a time span of 3 to 4 days to complete the process. Thus, teachers will require a substantial time commitment to carry out an assessment and intervention for each student in their class with behaviour difficulties. Given the impracticality in using functional analysis and intervention, it is likely that only a small proportion of the many students with behavioural difficulties will end up benefitting from it (Adelman & Taylor, 2002).

Another concern with functional analysis involves the range of possible functions or reinforcers that may serve to maintain specific behaviours. Several studies have demonstrated that individual behaviours may serve more than one function, making it particularly difficult for teachers to identify and isolate the variables maintaining them (Witt, VanDerHeyden, & Gilbertson, 2004). Further, the topography or form of a response (e.g., hitting, spitting, swearing, destroying property, etc.) rarely provides clues to how the behaviour is working for the child and what outcomes are being achieved. Based on their review of functional analysis studies, Hanley, Iwata, and McCord (2003) state that "considering the trends in the summary of function across topography, it appears that behavioural function and topography remain independent such that function cannot be predicted by the topography of problem behaviour" (p.167).

Due to these challenges in determining behavioural functions of problem behaviour, functional analysis can generally be used to treat only one child at a time. This creates a daunting challenge in many school boards where there is often a need for intervention for large numbers of students. For teachers or psychoeducational consultants to isolate the multiple functions of multiple behaviours across multiple children becomes little more than a pipe dream with the limited resources available in most schools. Gresham (2004) explained the troubles that functional analysis presents when he said, "Although much progress has been made over the past 15 years in FBA (functional behaviour analysis), the extent to which these findings can be generalized across populations, methods, settings, response classes, and practitioners is not well established" (p.335). For all of the above reasons, functional analysis remains a complex and sometimes ungainly process that does not always yield usable information.

It is clear that classroom management strategies need to be not only effective at reducing classroom disruptions but time efficient and easy for teachers to implement (Alderman & Nix, 1997; Witt, Hannafen, & Martens, 1983). One possible intervention strategy that may serve as a

more practical and efficient alternative to functional analysis has been referred to as the 'keystone' approach to treatment.

The Keystone Approach to Classroom Management

Children with conduct difficulties often demonstrate a range of behavioural difficulties (Nelson, 1988). Wittlieb, Eifert, Wilson, and Evans (1978) reviewed 36 single-case child behaviour therapy studies and discovered that there was more than one presenting problem in 67% of the cases. Some early studies and more recent research have demonstrated that modification of certain fundamental skills can produce broad benefits for children with multiple behaviour problems (Lalli et al., 1999; Soutor, Houlihan, & Young, 1994; Rincover, 1981; Voeltz & Evans, 1982; Wahler, 1975). These 'keystone' behaviours are foundational skills that, when modified, can result in changes to a wide range of behaviours for which no other intervention has been applied (Barnett, Bauer, Ehrhardt, Lentz, & Stollar, 1996).

Some researchers argue that teaching keystone skills results in far-reaching benefits because such skills are associated with clusters of behaviours that are maintained by the same contextual variables (Cataldo, Ward, Russo, Riordan, & Benett, 1986; Wahler, 1975). That is, when two or more behaviours produce the same consequence or outcome for the individual, they can be considered members of the same response class.

For example, Carr and Durand (1985) concluded that problem behaviour and communication belong to the same response class because both access the same function of conveying a child's wants. Researchers have sometimes referred to behaviours in the same response class as functionally equivalent (Ducharme, 2000). Because they serve the same function, treating one member of a response class can result in covariant changes in other members of that response class (Wahler, 1975). Kazdin (1982) coined the term 'response covariation' to describe those situations where a change in one response affects changes in other

responses.

An additional consideration for keystone behaviours is rooted in the concept of functional incompatibility. For example, since a child cannot be both compliant and defiant, compliance and oppositional behaviour can be considered functionally incompatible behaviours (Mace & Belfiore, 1990). Functional incompatibility occurs when the outcomes achieved by a prosocial behaviour momentarily eliminate the reinforcing value of a problem behaviour (Mace & Belfiore, 1990). Thus, a positive change in the outcomes for a prosocial response is likely to affect the response rate of a functionally equivalent and incompatible problem behaviour in the opposite direction (e.g., increasing reinforcement for compliance may increase compliance and reduce oppositional and other problem behaviour) (Parrish, Cataldo, Kolko, Neef, & Egel, 1986).

From a clinical perspective, the concept of 'keystone' is an important one, providing the potential for clinicians and careproviders to alter the many problem behaviours of an individual with an intervention focused on just one or a few target areas. Thus, behaviours that are too numerous, difficult, expensive or time consuming to modify directly may be changed by altering keystone behaviours that can be manipulated more cost effectively. Through reinforcement of specifically selected positive behaviours, the keystone approach obviates the need for use of reactive strategies to suppress problem behaviours, and thus the likelihood of adverse side effects often associated with use of punishment (Cataldo et al., 1986; Russo et al., 1981). Moreover, keystone behaviours can often be determined without extensive assessment of maintaining variables (Nelson, 1988). Knowledge about those responses that have been demonstrated to covary with each other can lead to a simplified selection of intervention targets that will produce optimal treatment effects (Martens, 1985).

Keystone behaviours also hold significant potential for improving maintenance and generalization of behaviour change efforts (Voeltz & Evans, 1982). Research has demonstrated

that the collateral effects produced after treatment of keystone behaviours have generalized across environments and practitioners. For example, Durand and Carr (1992) taught six misbehaving students attention-getting responses in order to communicate their need for attention. Results indicated that the students' use of responses increased, their number of misbehaviours decreased, and these changes were observed across several stimulus conditions and teachers. The authors attributed the generalized effects of interventions targeting communication, which is one of the keystone behaviours mentioned later in the paper, to the natural communities of reinforcement keystone behaviours recruit. That is, keystone behaviours evoke positive consequences from those in the environment without specific training. Consequently, targeting keystone behaviours may offer an efficient approach to programming for generalization and maintenance without use of additional treatment strategies.

Increased knowledge about relationships between behaviours could assist in predicting and maximizing the collateral changes that could be produced in behaviours not targeted through intervention (Houlihan, Sloane, Jenson, & Lavine, 1991). Several examples of keystone behaviours have been reported in the literature. Ducharme (2007a) listed four specific behaviours for which there is at least suggestive evidence of wide-ranging positive effects. These include compliance, social interaction, communication skills and on-task behaviour.

Compliance. Compliance involves the willingness of a child to adhere to the requests and instructions of authority figures. Such cooperation with adults is critical in achieving almost any goal, whether in the home or school environment (Ducharme, 2007b). Compliance plays an essential role in many seminal areas of development, including autonomy, internalization of moral values, self-control and socialization (McMahon & Forehand, 2005). Children's understanding of the importance of compliance to the demands of caregivers is a first step toward developing autonomous self-regulated behaviour (Kopp, 1982). In school, children's

noncompliance and the challenging behaviours that sometimes accompany it (e.g., tantrums, whining, arguing, etc.), are frequently cited by teachers as the underlying reasons for a child's inability to succeed academically or develop normal peer relations (Roberts, Tingstrom, Olmi, & Bellipanni, 2008). Noncompliance is prevalent in nearly all externalizing disorders in children and is ultimately the foundation for the diagnoses of Oppositional Defiant Disorder. It has been suggested that when a student's compliance level falls below 40%, their education may be hindered through limited instructional opportunities (Rhode, Jenson, & Reavis, 1993). A child who does not listen to instructions, follow directions, or successfully complete requested tasks will struggle with class assignments and fail to learn the material. Thus, academic achievement is greatly influenced by compliance in the classroom (Daly, Witt, Martens, & Dool, 1997).

Compliance is frequently targeted in interventions because of its keystone characteristics, that is, improvements in compliance are commonly associated with collateral reductions in problem behaviours and improvements in prosocial behaviours, such as academic achievement and social skills (Ducharme & Popynick, 1993; Cataldo et al., 1986; Matheson & Shriver, 2005; Parrish et al., 1986; Russo et al., 1981; Soutor, Houlihan & Young, 1994). Some of the behaviours that have been positively influenced through compliance training include yelling and bossing, self-injurious behaviour, mouthing objects, stuttering, crawling on furniture, leaving the instructional area, tantrums, and crying (Budd, Green, & Baer, 1976; Neef et al., 1983; Parrish et al., 1986; Striefel, Wetherby, & Karlan, 1976; Wahler et al., 1970; Zeilberger, Sampsen, & Sloane, 1968).

For example, Russo, Cataldo, and Cushing (1981) implemented a compliance training procedure with three preschoolers with developmental delays. The children were generally noncompliant with adult requests and showed several additional behaviour problems, such as crying, aggression, self-injurious behaviour, hair-pulling, and thumb-sucking. Using tangible and

social rewards, the researchers provided reinforcement contingent on compliance, but administered no decelerative consequences contingent on noncompliance or disruptive behaviour. The results showed that the procedure not only increased compliance across all three children, but decreased problem behaviours as well. Moreover, the children's problem behaviours generally increased when the compliance training procedures were discontinued, only to lessen as soon as compliant behaviours were reinforced again.

Cataldo et al. (1986) extended the study by Russo et al. (1981) by investigating whether the inverse relationship between aberrant behaviour and compliance found in their investigation resulted from contingent reinforcement and improvement of compliance rather than in response to the addition of reinforcing consequences in general. In a clinic setting, Cataldo et al. intervened with four children aged 3 to 7, who demonstrated a range of inappropriate behaviours, including noncompliance, aggression (kicking, pulling hair and biting), excessive crying and destructive behaviours. In a multiple baseline design, subjects were exposed to three conditions – no reinforcement, noncontingent reinforcement, and reinforcement contingent on compliance. In the subsequent treatment analysis, compliance was found to covary inversely with certain corollary problem behaviours and only when reinforcement was contingent on compliance. The researchers concluded that the changes in problem behaviour were associated with the modification of compliance and not merely the presentation of reinforcers.

In a more recent study, Piazza, Fisher, Hanley, Remick, Contrucci and Aitken (1997) evaluated the effects of a compliance-training program involving positive reinforcement (e.g., access to tangible items, and/or attention) and/or negative reinforcement (e.g., a break) on the destructive behaviour of three children. The results showed that positive reinforcement contingent on compliance produced concomitant reductions in problem behaviour. Correspondingly, the findings of a study by Lalli et al. (1999) demonstrated increases in

compliance and decreases in problem behaviour when using positive reinforcement contingent on compliance.

In a series of studies, Ducharme and his colleagues evaluated a non-intrusive approach to treatment of severe problem behaviour called Errorless Compliance Training (ECT). With this approach, parents encourage children to be cooperative with parental requests by teaching them to comply hierarchically, from requests that the child complies with consistently (e.g., "eat your cookie") to requests that the child rarely follows (e.g., "turn off the television"). Parents are directed to provide high levels of praise for each compliant response by the child and move slowly enough through the hierarchy that compliance stays at the same high rate with all requests as it did in the initial high probability request phase. By the end of treatment, caregivers are typically able to deliver even the lowest probability requests with no return to noncompliant behaviour.

For example, Ducharme and Popynick (1993) taught parents to use errorless compliance training with four children with developmental disabilities. Results showed that ECT was effective at producing generalized and durable compliance gains, as well as significant reductions in covariant oppositional behaviour in all four children. Ducharme, Pontes, Guger, Crozier, Lucas and Popynick (1994) replicated the Ducharme and Popynick (1993) study with an abbreviated version of ECT. They found similar treatment, generalization and covariant results with four children with developmental disabilities and two nondelayed siblings. The effectiveness of ECT as a keystone approach for problem behaviour has been demonstrated in several other studies across diverse populations of children, including children who have experienced family violence (Ducharme, Atkinson, & Poulton, 2000), and children of parents with cognitive, physical, and emotional deficits (Ducharme, Davidson, & Rushford, 2002; Ducharme, Spencer, Davidson, & Rushford, 2002). ECT has also been evaluated in a group

format (Ducharme, Popynick, Pontes, & Steele, 1996), and in a special needs classroom (Ducharme & Diadamo, 2005).

Matheson and Shriver (2005) extended the compliance keystone literature by training three teachers to provide effective commands and praise for student compliance in a classroom environment. They examined the effects of this training on student problem behaviour, as well as academic engagement (on-task behaviour and attention to instruction) and academic responding (fulfillment of tasks and requests). Results indicated that student compliance increased with the teachers' use of effective commands, and even more so when praise was added contingent on compliance. Furthermore, as student compliance increased, academic behaviours increased and competing disruptive behaviours decreased.

The relationship between academic behaviours and compliance found in this study is not surprising given the aforementioned link between classroom management and student learning (Gettinger, 1988). That is, students who follow instructions and listen to their teacher are more likely to become engaged in the learning material, complete the tasks and thus, benefit from the teachers' lessons. As noted by Matheson and Shriver (2005), "there is a degree of overlap in the response classes of compliance and academic behaviours such that complying with teacher instructions regarding classroom activities is also an academic behaviour and actively engaging in academic behaviours is a form of compliance" (p.216).

Additional studies have looked at response covariation between compliance and other academic behaviours. For example, Soutor, Houlihan and Young (1994) explored the relationship between compliance, attending and direct verbalizations in 3-year old twin boys diagnosed with autism and a speech and language delay. In a special needs preschool setting, the researchers used praise and edible rewards to reinforce the boys' compliance to requests. In addition to improvements in compliance, results indicated that both attending and direct

verbalizations increased under the reinforcement of compliance contingency.

Social Skills. Social interaction is deemed a key factor of adaptive functioning, and as a result, a frequent deficit among individuals with EBD (Mansell, Ashman, Macdonald, & Beadle-Brown, 2002). Matson, Minshawi, Gonzalez and

Mayville (2006) defined social skills as "the observable and measurable interpersonal behaviours that promote independence and social desirability" (p. 496). Social skills provide people with the means to appropriately interact with others, correctly appraise diverse social contexts, respond to social cues, understand social rules and avoid interpersonal conflicts (Matson et al., 2006). Further, social functioning largely influences one's ability to obtain peer acceptance, sustain meaningful interpersonal relationships and integrate into society (Newcomb & Bagwell, 1995).

Given the importance of social skills, it is not surprising that social deficits place youth at risk for problem behaviour (Koegel, Koegel, Hurley, & Frea, 1992). Many children with behavioural challenges, including those with developmental disabilities, self-injurious behaviour and externalizing disorders, have deficits in social behaviours (Duncan, Matson, Bamburg, Cherry, & Buckley, 1999; Njardvik, Matson, & Cheery, 1999). It has been suggested that individuals who lack socially appropriate behaviour may rely on maladaptive behaviours to meet their social needs (Matson et al., 2006).

In their study of 495 individuals with intellectual disabilities, Mansell et al. (2002) showed that social impairment was positively correlated with problem behaviours and negatively correlated with adaptive behaviours. Accordingly, Duncan et al. (1999) argued that those with aggression, self- injury, or both demonstrated significantly lower levels of social skills than did controls. Olson and Lifgren (1988) suggested that difficulty understanding social cues may lead to poor treatment by other children and a negative peer status, which is predictive of a later tendency to use aggressive solutions in social problem-solving. A growing body of literature

indicates 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 (Coie, Lochman, Terry, & Hyman, 1992; Walker, et al, 1994).

Some researchers have suggested that problem behaviour leads to reduced social skills rather than the reverse. For instance, young children who experience problems managing their behaviour and emotions at home may have difficulty transitioning into the social context when they begin schooling (Hughes, White, Sharpen, & Dunn, 2000). Patterson (1986) argued that noncompliant children begin school lacking social skills because teaching such skills to a tenaciously defiant child is extremely challenging for a parent. Patterson posits that, once in the classroom, the child's lack of social and rule-following skills leads to a downward progression of further rule-breaking, inattentive and antisocial behaviour.

This relationship between social skills and aberrant behaviour helps explain the evidence that social skills are a 'keystone' skill cluster; that is, social skills training can lead to broad positive change in child behaviour. Research has shown that by promoting appropriate social interaction in children, reductions in aberrant behaviour, as well as improvements in the capacity for learning, can be achieved (e.g., Lee & Odom, 1996; Strayhorn & Weidman, 1991).

In a meta-analysis of 29 social skill training (SST) interventions conducted with homogeneous groups of children experiencing externalizing behaviour problems, Ang and Hughes (2001) found an overall mean effect size of r = .55 at post-treatment. According to the binomial effect size display (BESD), this signifies that at posttest, approximately 71% of the children in the treatment group demonstrated reduced antisocial behaviour compared to only 29% of children in the control group.

Gresham, Cook, Crews, and Kern (2004) provided a comprehensive analysis of six published meta-analyses of SST interventions with youth at risk for EBD. Based on five out of

the six meta-analyses examined, the researchers found a weighted grand mean effect size of r = .29, indicating that overall, approximately 65% of the participants in the SST groups demonstrated reduced problem behaviour and/or increased prosocial skills compared to 35% of those in the control groups. Based on Cohen's (1977) conventional standards, an effect size of this magnitude would be regarded as "moderate." Although, the meta-analysis by Quinn, Kavale, Mathur, Rutherford, and Forness, (1999) suggested that SST interventions were not substantially effective in improving prosocial skills and reducing problem behaviours, Gresham and his colleagues raised concerns with their methodology. They noted that the Quinn et al. (1999) meta-analysis included less stringent inclusion criteria, samples of children without EBD, no requirement of a control group, and either an experimental or quasi-experimental design, and thus, included many studies with low or medium internal and external validity. Regarding the results from the other five meta-analyses analyzed, Gresham et al. (2004) concluded that SST is an effective intervention for children with EBD.

One of the studies that demonstrated the effectiveness of SST was conducted by Koegel, Koegel, Hurley, and Frea (1992). The researchers used SST with a focus on self-management to teach four children with autism how to manage their interactions across multiple settings. Findings indicated that with the initiation of self-management procedures in a clinic setting, all of the children’s social interactions rapidly improved, and collateral reductions were found in disruptive behaviour patterns. Furthermore, for three out of the four children, results in the home and community environments paralleled the improvements in the clinic setting.

Other research has examined the relationship between social interactions and stereotypic behaviour in children with autism, with the hypothesis that if peer interactions provide a more stimulating social environment, or engage these individuals in tasks that are incompatible with stereotypic behaviour, then a reduction in stereotypic responding might occur. Lee and Odom

(1996) and Lee, Odom, & Loftin (2007) trained peers without disabilities to initiate social interactions with children with autism and related disabilities during structured play time in their classroom. Children's social interactions increased and collateral reductions in stereotypic behaviour were observed. Moreover, Lee, Odom and Loftin (2007) observed improvements in the children's social interaction, as well as decreases in stereotypic behaviour in a generalization play setting.

Loftin, Odom, and Lantz (2008) found similar results in their study of three children with autism who exhibited repetitive motor behaviours. In this investigation, the children were taught to initiate social interactions with their peers, as well as to self-monitor and record their initiations to enhance generalization to natural settings. The researchers found increases in social initiations as well as concomitant decreases in repetitive motor behaviour. Positive effects were maintained over a month after the intervention finished.

Ducharme, Folino, and Derosie (2008) conducted a study focusing on development of a highly efficient social skills treatment that emphasized one specific social skill, acquiescence (giving in to the need and will of other children). The authors hypothesized that the concept of acquiescence might actually be a keystone within the social skills realm, especially for highly aggressive children.

In a multiple baseline across groups design, eight children with deficient social skills and severe problem behaviour in a specialized behavioural class participated in the intervention, labeled 'Errorless Acquiescence Training'. Treatment involved modeling and role playing of social skills with a focus on acquiescence (e.g., sharing, letting others go first) and a scaffolded play session in which children were supported with prompts and praise that were faded over time. Results demonstrated substantial improvements in acquiescence and other prosocial skills, as well as collateral reductions in antisocial behaviour. Moreover, improvements generalized to

free-play periods. The findings of this study are particularly encouraging because the intervention was highly efficient and produced substantial and broad-ranging behavioural improvements.

Interventions targeting social skills have indirectly produced gains in academic behaviours in the classroom as well. For example, Hodgens and McCoy (1990) explored the effectiveness of a social skills coaching intervention when combined with peer utilization procedures on the social skills of five withdrawn preschool children. The modified coaching treatment included verbal instructions, behavioral rehearsal, performance feedback, smooth turn-taking and listener responsivity. Results of the multiple baseline analysis revealed that social initiations, peer responses (positive verbalizations to peers) and sustained interactions increased for all five participants, and these effects generalized to different peers, settings and behaviours. Specifically, effects were maintained in the presence of three new peers for each subject, in a classroom setting and with behaviours that were not targeted in treatment (e.g., on-task behaviour). In fact, participants demonstrated higher levels of alone on-task behaviour at postreatment than that of comparison peers.

Although in many research studies, social skills interventions have been combined with other procedures that make it difficult to determine component contributions, there is sufficient evidence to suggest that social skills training is an effective means of producing covariant effects on problem behaviour and skills not specifically trained. There is, however, a need for research on more efficient strategies for teaching social skills and keystone subskills (e.g., Errorless Acquiescence Training), as many social skills training programs require intensive child involvement in the training of many interaction skills that can be quite time-consuming and expensive to conduct.

Communication. Communication is purposeful behaviour used within the framework of social exchanges**,** to convey information, observations, or internal states, or to bring about changes in the immediate environment (Schuler, Prizant, & Wetherby, 1997). For a developing child, communication has three primary purposes, all typically developed by twelve months of age. These include behavioral regulation (used to satisfy physiological needs), social interaction (used to initiate, respond to, maintain or terminate social communications) and joint attention (used to direct another's attention to an object, event, or topic of a communicative act) (Schuler, Prizant, & Wetherby, 1997).

Communication skills are crucial in both the academic and social atmosphere of the school environment (Thatcher, Fletcher & Decker, 2008). In school, communication serves important social functions for students, such as eliciting assistance on difficult academic work and praise for good performance (Durand & Carr, 1991). Children with EBD often experience communication problems, which may lead to self-concept and self-esteem difficulties and affect peer relationships (Hyter, 2003). As a result of communication difficulties, children with EBD often rely on maladaptive behaviour to express what they want (Carr & Durand, 1985).

Recent research has demonstrated that most problem behaviour can be viewed as adaptive for individuals in challenging environments (Kevan, 2003). Based on the premise that many aberrant responses are nonverbal means of communication, problem behaviour and verbal communication may be equivalent in function (Carr & Durand, 1985). In the absence of the ability to verbally convey needs when in a state of pain, frustration, hunger, fatigue, or boredom, an individual might engage in disruptive behaviour, a strategy that often leads to the desired outcome being sought. In such cases, teaching the individual a functionally equivalent communicative response could serve to replace the problem behaviour, thereby rendering it unnecessary. Thus, the use of effective communication is a keystone skill that, when trained, is

likely to result in a broad range of gains for the individual (Barnett et al., 1996).

As mentioned earlier, communication and problem behaviour appear to comprise a response class (Langdon, Carr, & Owen-DeSchryver, 2008). That is, both communicative and disruptive responses can produce the same effect on the environment (Carr & Durand, 1985), suggesting clear directions for intervention. For example, a child who throws a tantrum and engages in destructive behaviour in order to escape a difficult class assignment can be taught to request assistance on tasks (e.g., "I don't understand"). Similarly, a student who acts out in order to receive attention would be taught an appropriate response to communicate that desire (e.g., "Am I doing good work?"). The logic behind this approach is that if an individual has an alternative, more efficient way of obtaining the outcomes that maintain his or her problem behaviour, the problem behaviour would no longer be needed (Durand & Merges, 2001).

An association between communication difficulties and aberrant behaviour has long been recognized in the literature (Bott, Farmer, & Rhode, 1997: Chung, Jenner, Chamberlain, & Corbett, 1995; Schroeder, Schroeder, Smith, & Dalldorf, 1978). For example, Schroeder, Schroeder, Smith, and Dalldorf (1978) reported that 63% of individuals with severe self-injurious behaviour and 72% of those with mild self-injurious behaviour were found to have no expressive language. Moreover, Bott et al. (1997) discovered that individuals with further developed speech skills demonstrated a lower frequency of challenging behaviours 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 behaviour. The children's communication skills and severity of 58 problem behaviours were assessed every 6 months over a period of 3 years. Results provided support for the hypothesis that impaired communication development may have a functional role in the emergence of problem behaviour.

Functional Communication Training (FCT) was designed to teach individuals functional communicative behaviour as a means of reducing challenging behaviour (Carr & Durand, 1985). Over the past twenty-five years, FCT has become an empirically validated approach for reducing problem responding. The approach involves assessing the function of the behaviour problem using one or more functional assessments and then teaching an alternate behaviour in the form of a communicative response to serve as a replacement (e.g., Durand and Carr, 1991). Carr and Durand (1985) introduced FCT as an approach for the treatment of problem behaviour in persons with developmental disabilities. The study consisted of three stages. First, a functional assessment was conducted for each of the four child participants. Based on the assessment results, each child was taught responses that matched the assessed function of their behaviour (relevant responses), as well as responses that did not match the function of their problem behaviour (irrelevant responses). Findings revealed that the children's problem behaviour decreased only when they utilized the matching functional response. Next, FCT was conducted and the participants were 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 behaviour, reductions in aberrant behaviour and increases in appropriate communication occurred.

These results were replicated in Durand and Crimmins (1987), where the researchers evaluated FCT on the unusual speech and disruptive behaviour of a boy with developmental disabilities. Reductions in unusual speech and disruptive behaviour occurred only when alternative communicative behaviours were taught that matched the function of the problem behaviours. Day, Horner, and O'Neill (1994) investigated the effect of FCT on children whose problem behaviour served the dual behavioural outcomes of escape from difficult tasks, and access to preferred objects. The three participants were taught functionally equivalent

communicative responses and their problem behaviours were placed on extinction. Results indicated that only after each communicative response was taught in both conditions (escape from challenging tasks and access to tangible items) did problem behaviour decrease to clinically acceptable levels. Braithwaite and Richdale (2000) replicated Day et al.'s study and provided additional support for the use of extinction and FCT in the reduction of multiply controlled self-injurious and aggressive behaviours.

Durand and Carr (1991; 1992) provided further evidence for the inverse relationship between communication and aberrant behaviour, and demonstrated that the collateral effects can be transferred across new tasks, environments and teachers, as well as maintained over time. In the latter study, the authors also compared the effectiveness of FCT to time-out from positive reinforcement. At the outset, both interventions were successful in reducing challenging behaviours, however, when the children were in a novel classroom with a teacher who was unaware of the previous intervention, only children who had received FCT continued to use communicative requests and demonstrate low levels of challenging behaviour.

Although FCT requires a functional analysis, and the keystone approach is proposed here as a strategy that could render functional analysis unnecessary in many classroom situations, the extensive data showing reduced disruptive behaviour with the teaching of communication strategies suggests that the simple focus on prompting communicative responses at times when individuals typically demonstrate problem behaviour (that is, teaching communication skills) has the potential to be an effective keystone approach to behavioural remediation even when functional analysis is not employed.

On-task Behaviour. Students are considered to be on-task when they are actively engaged in classroom activities that facilitate learning, and not engaged in behaviours that detract from learning **(**Lee, Kelly, & Nyre, 1999). Given that a child cannot complete an academic task

successfully without attending to what he/she is doing, on-task behaviour is a necessary prerequisite for effective performance and academic achievement (Richmond, McCroskey, Kearney, & Plax, 1987). In an examination of students' academic behaviour in high school classrooms, Frederick (1977) discovered that high-achieving students were academically engaged 75% of the time, compared to 51% for low-achieving students. Thus, the more time students remain disengaged from activities, the more likely their academic performances will suffer.

Problem behaviour during required academic tasks is often focused on specific outcomes, such as escape from the difficulty of a task, or attention/assistance from the teacher (Lalli, Kates & Casey, 1999). Thus, if students are able to complete a task effectively, they are less likely to demonstrate problem responses. Moreover, when children are actively working on a task, or participating in an activity, they spend less time engaging in disruptive behaviour because the two behaviours are incompatible with each other. For this reason, on-task behaviour can be targeted in treatments; such training is likely to produce the same covariant effects as other keystone skills.

Ducharme and colleagues have conducted studies demonstrating collateral reductions in off-task and disruptive behaviour following intervention with on-task behaviour (e.g., Ducharme & Harris, 2005; Ducharme, Lucas, & Pontes, 1994). The researchers investigated the effects of errorless embedding, a graduated, success-focused and nonpunitive treatment for increasing on-task responding.

The errorless embedding procedure begins with observations to determine task-related conditions associated with high and low levels of disruptive behaviour. Short durations of the problem conditions (i.e., independent work on a challenging task) are then embedded into longer durations of conditions associated with no problem responding, typically through moderation by

the teacher (e.g., teacher prompt support; rapport-building). During the moderated portion of the sessions, the teachers can provide assistance with the task and praise the children for compliance to simple requests. As the treatment progresses, the proportion of time the child spends working independently is increased as teacher support is faded, all at a slow enough rate to prevent an escalation of maladaptive responding.

In a multiple baseline across tasks design, Ducharme, Lucas and Pontes (1994) investigated the effects of the errorless embedding intervention on a young girl with autism who exhibited high levels of oppositional behaviour when faced with three different academic tasks. They found that oppositional behaviour was reduced by more than 60% for each task following intervention. Ducharme and Harris (2005) examined the behaviour changes in five young students with severe behavioural difficulties. They observed substantial improvements in on-task responding and reductions in off-task/disruptive behaviour of all children during academic tasks.

Witt, Hannafin, and Martens (1983) investigated the relationship between on-task and problem behaviour by conducting a home-based academic reinforcement program on three 4th-grade students who engaged in high rates of challenging behaviour. Academic performance was defined as the amount of time students were engaged in seatwork or were listening to the teacher. The researchers found significant increases in percentage of academic responses and significant decreases in percentage of problem behaviour from baseline to treatment.

Lalli et al. (1999) examined whether accurate academic responding formed an inverse functional relationship with challenging behaviour in their study with two boys with mild mental retardation. Treatment was conducted to improve the participants' spelling, since aggressive behaviour was most frequently demonstrated during this instruction. Findings revealed that with the initiation of treatment, improvements in correct academic responding to spelling instruction covaried with reductions in the children's challenging behaviours. The researchers concluded

that the increase in academic responding was at least partially a function of the decreased amount of time spent participating in aberrant attempts to escape these formerly intolerable tasks.

In addition to collateral changes in problem behaviour, on-task behaviour as a treatment target can also lead to improvements in academic performance (e.g., Maag, Rutherford, & DiCangi, 1992). McLaughlin, Dolliver, and Malaby, (1979) used a Timer Game and token reinforcement to improve the on-task behaviour of ten students in a special needs class. For the Timer Game, the teacher awarded each student points for being engaged in work when a timer went off on a variable schedule of 5 minutes. Results showed a higher percentage of on-task behaviour during the Timer Game and in follow-up (5, 15, and 25 days later) than in baseline conditions. Additionally, collateral changes in the students' academic achievement, defined by the number of problems completed, were also observed. Corresponding results were found by McLaughlin, Laffey, and Malaby (1977). In this study, direct teacher instruction and reinforcement for on-task behaviour led to improvements in the targeted behaviour, as well as correct work output (the percentage of correct math problems) for disruptive students.

In more recent studies, covariation between on-task behaviour and academic achievement was observed following treatments incorporating self-monitoring components. Both Maag, Rutherford, and DiCangi (1992) and Wood, Murdock, Cronin, Dawson, and Kirby (1998) taught students to use self-monitoring procedures that involved observing and/or recording their own on-task behaviour. Maag et al. additionally used contingent reinforcement for on-task behaviour. Findings from both studies indicated that when the self-monitoring procedures were introduced, student on-task behaviour improved. Concomitant increases in academic performance (completion of assigned work) were also observed. Wood et al. (1998) found that the effects of the self-monitoring generalized across three academic settings (language arts, reading, and computer class).

Given that remaining on-task is a form of compliance to teacher requests, researchers have examined the effects of targeting on-task behaviour on compliance to other classroom requests. For example, Workman, Helton, and Watson (1982) investigated the effects of a self-monitoring procedure on the on-task behaviour of a frequently off-task child in a preschool classroom. Findings showed that the self-monitoring procedure led to increases in on-task behaviour, which correlated with increases in compliance. Houlihan et al. (1991) used a scatterplot analysis to examine the effects of one treatment during which compliance was reinforced and another treatment in which on-task behaviour was reinforced. Results were variable, but consistently showed covariation between the behaviours, as when compliance was reinforced, subjects 1, 2, and 4 showed increases in on-task behaviour, and when on-task behaviour was reinforced, subjects 3 and 4 showed improvement in compliance.

Based on the research presented here, it would appear that a focus on building on-task behaviour can lead to a number of positive effects, including reductions in student problem behaviour and improvements in academic output. Thus, on-task skills can be included as one of the core keystone behaviours that should be targeted by teachers in the classroom.

Conclusion

Summary. This review has concentrated on the need for an effective, practical intervention that can be used for the treatment of disruptive student behaviour in the classroom. The training teachers receive prior to entering the classroom often does not adequately prepare them for the classroom management challenges they are likely to face. As a result, teachers frequently endure stress in their efforts to manage student behaviour in the classroom and may experience a reduction in their perceived competence about teaching. High levels of stress and low levels of self-efficacy in teachers are associated with increased use of reactive strategies to deal with student misbehaviour. Overly stressed teachers often find that using reactive strategies

results in the immediate termination of problem behaviour and thus, a temporarily manageable classroom. However, the use of some reactive strategies may result in the inadvertent reinforcement of problem behaviour, thereby increasing the probability of the misbehaviour reoccurring in the future (Maag, 2001). Furthermore, the termination of problem behaviour through reactive approaches does not teach students a more prosocial means of tolerating adverse classroom conditions.

Considering the disadvantages of reactive approaches, research has increasingly promoted the use of more proactive methods to manage student problem behaviour, particularly those involving functional analysis. Functional analysis has become the gold standard in managing problem behaviour because it involves determination of the outcomes achieved by children through problem responses, as well as the specific focus of intervention (Witt, Daly, & Noell, 2000). However, despite its extensive use in research, functional analysis is not commonly accepted or adequately practiced by teachers in the classroom. Some researchers have suggested that teachers' resistance may be due to the expertise and time required to implement functional analysis, the focus on individual students rather than on the entire class, and the common need to observe the context of each behaviour in order to isolate the function and make modifications.

The use of keystone behaviours in intervention addresses many of the challenges associated with functional analysis. Considering that modification of a keystone behaviour may lead to collateral improvements in other behaviours, multiple behaviours can be treated simultaneously. Additionally, since keystone behaviours can often be determined and treated without formal assessment of the variables maintaining those behaviours, interventions involving keystone skills are significantly less time-consuming and complicated, and can be implemented on a class wide level. Moreover, there is growing evidence that the collateral improvements

produced from treating keystone behaviours can generalize across environments and practitioners, and maintain over time.

Clinical Implications. Barnett et al. (1996) described teaching keystone skills as an approach that meets the needs of both teachers and students. They reasoned that because the approach is fairly simple to use and produces widespread positive effects, it is the ideal intervention approach for teachers to implement in the classroom. Considering the constraints on teachers' time and budgetary limits of school boards, comprehensive long-term interventions that target individual behaviours are not practical or realistic for teacher use (Malouf & Schiller, 1995). In contrast to classroom management approaches based on functional analysis that require complicated assessments and time-consuming manipulation of conditions, keystone strategies can be incorporated into routine teacher practices. Furthermore, keystone strategies readily lend themselves to a class-wide approach. Because keystone skills are valuable for all students, teachers can focus on building such skills in all class members rather than treating each student separately. Thus, knowledge of keystone behaviours and experience with strategies for teaching such skills would be extremely advantageous for teachers.

Given the increased number of children with EBDs in today's mainstream schools, and the inadequate training teachers typically receive in behaviour management, incorporating instruction on keystone approaches into preservice programs might aid teachers in the classroom. The simple but effective nature of keystone strategies will help teachers successfully reduce their students' misbehaviour and maintain an orderly class. As a result, teachers should feel more competent in their ability as educators, thereby reducing the likelihood of burnout or feelings of inadequacy.

Training in keystone strategies would also provide teachers with the resources necessary to manage disruptive student behaviour without the use of reactive consequences. As more

students experience success in the use of these skills and spend their time on classroom-related tasks, teachers are able to devote much more of their time to the instructional activities that further students' learning rather than on reactions to problem responses. The proactive nature of keystone strategies provides increased opportunities for teachers to promote prosocial and supportive behaviour for the students, whereas the use of reactive strategies may lead teachers into modeling negative patterns of behaviour (Martin, Linfoot, & Stephenson, 1999).

In a recent article, Ducharme (2007a) provided a format for teaching preservice teachers how to use keystone behaviours as part of a class-wide approach to intervention. The approach requires teachers to scaffold students with their efforts in each of the keystone skill areas of compliance, social skills/acquiescence, on-task skills and communication. By focusing on prompting students to success in all of these areas, reinforcing their prosocial responding, and gradually reducing support while increasing behavioural expectations, teachers can provide students with a solid foundation of skills that will render a large proportion of problem responses unnecessary. For example, for building child compliance, teachers can start by delivering high probability requests (i.e.., those that are highly likely to yield compliance, e.g.., "help me clean the blackboard"), especially to those students with compliance difficulties. Teachers can praise compliance to such simple requests and then gradually increase the difficulty level of demands, with continued praise for cooperative responding to these more challenging requests.

The use of similar prompt, reinforcement and fade procedures with all keystone skills may provide teachers with an approach that is far more practical than those that require systematic assessment of contextual variables and individualized intervention for each problem response that arises. For this reason, the keystone approach is a proactive alternative to classroom management that may have the potential to address many of the teacher training,

stress and self-efficacy issues that plague the profession and lead so often to teacher reactivity and burnout.

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