ERRORLESS CLASSROOM MANAGEMENT FOR STUDENTS WITH SEVERE
CONDUCT PROBLEMS: A STAFF-TRAINING APPROACH

by

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Proactive classroom management involves teacher use of a range of positive interaction and intervention strategies for managing student behaviour in the classroom. This approach to classroom management has been shown to positively influence student academic achievement, behaviour, and social-emotional well-being, as well as teacher job satisfaction, stress levels, and turnover rate. Unfortunately, teachers often receive minimal training in such strategies, leading them to use more reactive forms of classroom management as a means of controlling problematic student behaviour. Given that reactive procedures can have many unintended negative side effects, there is a need for in-service provision of additional teacher training in proactive approaches, especially in classrooms where student problem behaviours are rampant.

The present study was designed to address this need by examining the effectiveness of Errorless Classroom Management (ECM), a proactive classroom management program that builds student tolerance to classroom challenges by teaching them four keystone skills: compliance, social skills, on-task behaviour, and communication. We provided ECM training to two staff members (one teacher and one educational assistant) who were working in a special education classroom for students demonstrating extremely high levels of severe antisocial behaviour. The goal of this in-
service training program was to alter staff members’ classroom management practices in order to engender covariant improvements in student behaviour.

Using time-series observations, we examined staff and student behaviour before and after ECM training. We also investigated the social validity of treatment effects through the use of staff-report questionnaires. Data revealed that staff members effectively reduced their use of reactive strategies following training but were inconsistent in their application of proactive strategies. In turn, student problem behaviour markedly declined following training; however, improvements on other student outcome measures were not consistently observed. Moreover, variability in staff members’ satisfaction ratings and stress scores suggest a modest overall level of social validity. These findings provide early support for the ECM training program as a socially acceptable form of intervention. These results also suggest that it is possible to effect change in student behaviour by training staff members in positive forms of classroom management.
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1.1 Problem Behaviour in Children

Mild oppositional and aggressive behaviours are a normative part of childhood (Frick, 1998; Matthys & Lochman, 2010) and improve in most children without formal intervention (Kazdin, 1995). However, for some children, these behaviours may persist, intensify, and develop into a stable pattern of conduct problems. When this occurs, clinical attention is warranted, as severe problem behaviours in childhood have been linked to a range of adverse outcomes, including poor educational achievement, school dropout, juvenile delinquency, adult criminality, substance abuse and dependence, risky sexual behaviour, domestic violence, and future mental health problems (Bardone, Moffitt, Caspi, & Dickson, 1996; Bardone et al., 1998; Fergusson, Horwood, & Ridder, 2005; Fergusson & Woodward, 2000; French & Conrad, 2001; Huesmann, Eron, Lefkowitz, & Walder, 1984; Kim-Cohen et al., 2003; Kratzer & Hodgins, 1997).

Although the prevalence of clinically severe conduct problems varies according to age, gender, socioeconomic status, and diagnostic criteria (Lahey, Miller, Gordon, & Riley, 1999), most overall estimates fall somewhere between 1 and 16% of the population (Loeber, Burke, Lahey, Winters, & Zera, 2000; Maughan, Rowe, Messer, Goodman, & Meltzer, 2004). Severe conduct problems pose a tremendous cost to society, placing a heavy financial burden on the educational system, the legal system, and social and mental health services (Cohen, 1998; Scott, Knapp, Henderson, & Maughan, 2001). The following discussion focuses specifically on children’s conduct problems in an educational context, exploring the ways in which school systems and educators manage antisocial behaviours.
1.2 The Functional Nature of Problem Behaviour

Behavioural psychology stems from the notion that human behaviour may be understood through the relationships between environmental stimuli and observable responses (Watson, 1913 as cited in Gray, 1999). Although many behavioural researchers have contributed to the development of this field, B. F. Skinner is often viewed as the most prominent and influential (Poling, Methot, & LeSage, 1995). Skinner popularized and advanced earlier work by Edward Lee Thorndike, who suggested that behavioural responses are more likely to occur if they lead to satisfying outcomes and less likely to occur if they lead to unpleasant effects (Thorndike, 1898 as cited in Gray, 1999). Skinner referred to the theory based on this idea and related concepts as operant conditioning, and he developed a vocabulary for various principles of learning that continues to be used today (Skinner, 1938, 1953, 1974).

According to operant conditioning theory, behaviours are developed and maintained by their resulting consequences. Consequences that increase the likelihood of a behaviour are referred to as reinforcers and may occur in two forms: positive reinforcement and negative reinforcement (Skinner, 1938). Positive reinforcement occurs when a rewarding or favourable stimulus (e.g., food or praise) is introduced following a particular response. Negative reinforcement occurs when an unpleasant or aversive stimulus (e.g., an electric shock or a challenging task) is removed following a response. Thus, behaviours are likely to develop and maintain because they serve a specific reinforcing function, leading to desirable outcomes for the individual.

Skinner also discussed the concept of stimulus control, which explains that a particular behavioural response is reinforced only in the presence of certain stimuli.
(Skinner, 1974). Therefore, the response becomes more likely to occur in the presence of these stimulus conditions, and it is unlikely to occur in their absence.

Operant principles are readily applied to our understanding of children’s problem behaviour. When children engage in antisocial acts, they often do so as a means of accessing attention, tangible objects, or sensory stimulation (i.e., positive reinforcement; Lewis & Sugai, 1996). Other child problem responses can lead to the removal of an unpleasant or aversive stimulus (i.e., negative reinforcement; Lewis & Sugai, 1996). In this case, the outcome achieved is avoidance or escape from undesired events, situations, or activities, such as chores or homework. Children typically resort to using problem behaviours when they do not possess the necessary skills to gain access to desired outcomes in more prosocial ways (Carr et al., 1999; Durand, 1990).

In the classroom, children’s antisocial behaviours typically function in the same manner, providing students with access to desirable outcomes. For instance, a student might become disruptive or aggressive during an academic work period to avoid the aversiveness of a difficult assignment, or might disrupt the classroom to access teacher or peer attention. Thus, despite their antisocial nature, problem behaviours serve an important function for children and represent an adaptation to a challenging environmental context (Ducharme, 2008).

1.3 Special Education Practices in Ontario

Historically, individuals with special needs in North America were educated predominantly in institutional settings (Bennett, Dworet, & Weber, 2008; Winzer, 2008). The model of providing segregated education for persons with disabilities remained largely unchallenged until the 1960s, at which time inquiries into the practices and the
conditions of special education institutions surfaced (Winzer, 2008). The 1960s also marked the beginnings of a growing movement towards reducing inequality and discrimination in the education system. Advocates of this cause took their cue from the American civil rights movement, arguing that disability should not pose a barrier to equal rights and education (Bennett et al., 2008).

In 1975, the Education of All Handicapped Children Act was introduced in the United States, mandating the provision of free appropriate public education for all students, including those with disabilities (Deiner, 2010). This law created a momentous change in the way children with special needs were treated in American schools (Carleton, 2002). Soon after, similar legislation was passed in various Canadian provinces, including Nova Scotia and Saskatchewan (Bennett et al., 2008). In the province of Ontario (the setting of the present investigation), the Education Amendment Act, commonly known as Bill 82, was signed into law on December 12, 1980. This legislation, which required all school boards to provide publicly supported special education services to exceptional students, marked a significant development in the history of special education in Ontario (Bennett, 2009; Bennett et al., 2008).

After the passing of Bill 82, it became common practice for most special education services to be provided through separate programming in self-contained classrooms (Bennett et al., 2008). However, with the surfacing of the Regular Education Initiative in the mid-1980s, advocacy for integrating students with special needs into mainstream classrooms began to grow (Bennett et al., 2008). This shift towards inclusion emerged out of the desire to promote equality, reduce categorization, and address students’ individualized needs in the least restrictive environment possible (Gartner &
Lipsky, 1987; Kavale, 2002). It was also suggested that integrated education might increase the social competence of students with special needs, allowing them to develop positive relationships with their typically-developing peers, while facilitating an attitude of acceptance and understanding among nondisabled peers (Cartledge & Johnson, 1996; Snell, 1990).

The Regular Education Initiative played an important role in shaping the present model for special education service delivery in the province of Ontario. Currently, Ontario uses an inclusionary schooling model for addressing the needs of exceptional pupils, with 81% of Ontario’s exceptional learners placed in mainstream classrooms as of 2008 (Bennett et al., 2008). In a report for the Ontario Ministry of Education, Bennett and Wynne (2006) recommended that students with special needs continue to first be considered for placement in a general education classroom; however, for those students whose needs were not met in such a setting, a range of other placement options would be considered. The authors of this report noted that these alternate placements should be “duration-specific, intervention-focused, and subject to regular reviews” (Bennett & Wynn, 2006, p. 8).

The Ontario Ministry of Education has continued to make advances in the provision of services and supports to students with special needs. Funding for special education services in Ontario has been on the rise since 2002, with approximately $2.5 billion devoted to special education from 2012 to 2013 (Ontario Ministry of Education, 2013). This represents almost 12% of the nearly $21 billion allocated for education in Ontario. Importantly, special education funding is separate from per pupil funding issued to boards of education (Bennett et al., 2008). These special education funds are protected
and must be spent on the provision of services to students with special needs.

Unfortunately, despite substantial funding for students with exceptionalities, it seems as though the demand for supports always exceeds the available funds (Bennett et al., 2008).

Presently, students typically gain access to special education services in Ontario by means of a five-step process (outlined by Bennett et al., 2008). First, the student is recognized as a potential candidate for special education. Second, the student’s needs and progress are discussed with the school’s special education resource teacher. Third, the student is brought to the attention of the in-school support team, at which point an Individual Education Plan\(^1\) may be developed and a student may be referred for further assessment. Fourth, when necessary, the student is referred to an Identification, Placement and Review Committee\(^2\) to determine whether the student should be identified as an exceptional pupil whose “behavioural, communicational, intellectual, physical, or multiple exceptionalities are such that he or she is considered to need a placement in a special education program” (Ontario Education Act, R.S.O. 1990, c. E.2). Fifth, the student’s placement may be adjusted and an Individual Education Plan may be implemented.

1.4 Classroom Placements for Students with Behavioural Problems

Determining the most appropriate placement for students with behavioural exceptionalities has long been a contentious issue. Although Identification, Placement and Review Committees attempt to place students in the least restrictive setting, there are

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\(^1\) An Individual Education Plan is a written plan of action that summarizes a student’s strengths and needs. It sets out strategies to achieve individualized goals and objectives for that student (Ontario Ministry of Education, 2001).

\(^2\) An Identification, Placement and Review Committee may consist of superintendents, principals, special education consultants, resource teachers, general education teachers, psychologists, and social workers. The committee reviews assessment data, determines whether a student should be identified as exceptional, and decides on appropriate placements and programs (Ontario Ministry of Education, 2001).
times when a self-contained “behavioural” classroom may be selected as the best fit for a student with extreme behavioural needs (Bennett et al., 2008).

There have been a number of rationales for placing students with severe behavioural disorders in specialized classroom settings (Simpson, 2004; Simpson & Munderschenk, 2012; Stephens & Lakin, 1995; Walker, Ramsey, & Gresham, 2004). First, placement in self-contained classrooms allows the provision of specific programming to address the challenging behaviour and social difficulties of these students (Kauffman, Bantz, & McCullough, 2002; Kauffman, Lloyd, Baker, & Riedel, 1995). For example, students in behavioural classrooms can often participate in formal programs designed to enhance problem-solving abilities, social skills, communication, or anger management (Cartledge & Johnson, 1996; Kauffman et al., 2002). Second, given that these specialized educational settings typically have fewer students than mainstream classrooms, teachers can provide individualized academic instruction and remediation (Kauffman et al., 2002; Tobin & Sprague, 2000). This is an important consideration given that students with behavioural challenges often show significant academic difficulty (Connor, 2002; Farmer, Quinn, Hussey, & Holahan, 2001; Hagaman, 2012). Finally, the severe disruptive and antisocial behaviour exhibited by students with behavioural disorders may compromise the safety and education of other pupils (Kauffman et al., 2002; Heflin & Bullock, 1999). Thus, educating these students in separate classes may be advantageous for students who have no conduct issues.

Notwithstanding these rationales, bringing together a group of students with conduct difficulties poses a variety of challenges. When all students in a classroom demonstrate challenging behaviour, the potentially hectic environment may limit
opportunities for learning (Wehby, Lane, & Falk, 2003). Additionally, self-contained classrooms may offer little to no interaction with typically developing peers, resulting in limited modeling of and exposure to prosocial behaviour. Furthermore, behavioural classrooms may normalize and foster misbehaviour through the process of deviancy training, in which children with conduct problems endorse each other’s devious ideas and collaborate in antisocial acts (Dishion & Andrews, 1995; Dishion, Spracklen, Andrews & Patterson, 1996; Snyder et al., 2008). Despite these drawbacks, behavioural classrooms have the potential to provide enriched learning environments that are tailored to the educational, social, and behavioural needs of the children they serve if adequate staffing is provided and teachers possess strong skills in classroom management (Tobin & Sprague, 2000).

1.5 Teacher Training in Classroom Management

Classroom management is a broad term that typically refers to “actions taken by the teacher to establish order, engage students, or elicit their cooperation” (Emmer & Stough, 2001, p. 103). Effective classroom management skills are indispensable for teachers, as they allow for the maintenance of a supportive, stimulating, and orderly learning environment (Reinke, Herman, & Sprick, 2011) and have been positively linked to students’ academic success, prosocial behaviour, and social-emotional wellbeing (e.g., McGarity & Butts, 1984; Shernoff & Kratochwill, 2007; Somersalo, Solantaus, & Almqvist, 2002; Webster-Stratton, Reid, & Stoolmiller, 2008). Moreover, a teacher’s ability to maintain a well-controlled classroom with few problem behaviours has positive effects on their job satisfaction, stress levels, and turnover rate (Adera & Bullock, 2010; Clunies-Ross, Little, & Kienhuis, 2008; Kyriacou, 2001).
Unfortunately, many teachers do not have the skills required to maintain classroom order and often feel unprepared to effectively handle student problem behaviour (Barrett & Davis, 1995; Hardman & Smith, 2003; Martin, Linfoot, & Stephenson, 1999; Merrett & Wheldall, 1993; Pilarski, 1994). Moreover, many pre-service teacher education programs from around the globe (e.g., the United States, the United Kingdom, Australia, Canada, the Netherlands, and Germany) place minimal emphasis on the development of effective classroom management skills (Wubbels, 2011).

In one early study of teacher preparation in classroom management, Wesley and Vocke (1992) reviewed 111 university teacher preparation course catalogues from 39 different American states. The authors found that only 37% of university teacher preparation programs offered courses that focused on classroom management and very few of these courses were mandatory.

In a more recent study investigating classroom management preparation at 31 teacher education programs in New York City, Hammerness (2011) found that less than half (approximately 45%) of the programs reviewed required any coursework in classroom management. Similarly, a study of teacher education programs in Israel (Ben-Peretz, Eilam, & Landler-Pardo, 2011) revealed that while most training programs (approximately 89%) offered at least one course in classroom management, it was typically non-compulsory. In fact, the authors of one study estimated that pre-service teachers in the United States spend a mere 57 minutes learning about classroom management throughout the duration of their pre-service training (State, Kern, Starosta, & Mukherjee, 2011).

Notwithstanding the above-described studies, there has been limited research
directly examining the course content of general pre-service teacher education programs (Stough, 2006), and research on classroom management preparation within special education training programs has been even sparser (Oliver & Reschly, 2010). In fact, one group of authors commented, “research in special education teacher education is almost nonexistent” (Brownell, Ross, Colón, & McCallum, 2005). Thus, despite the need for even greater attention to classroom management in special education settings (where student behaviour problems are often commonplace), it is unclear just how much preparation special education teachers receive.

Nevertheless, one recent study did examine the preparation of special education teachers in classroom management (i.e., Oliver and Reschly, 2010). As part of this investigation, the authors reviewed 26 course syllabi from special education teacher preparation programs in the United States and found that only 27% of programs had an entire course devoted to classroom management. While the other 73% of programs had some content in behaviour management embedded within other courses, the extent and focus varied by program (Oliver & Reschly, 2010).

An additional challenge in the field of special education teacher preparation concerns the generic nature of many special education training programs. In particular, these programs tend to have a broad focus and do not provide pre-service teachers with sufficient preparation in the specific disability area in which they will teach (Cooley-Nichols, 2004). Given this non-specific training, special education teachers often feel poorly prepared for dealing with students who have emotional and behavioural disorders (George, George, Gersten, & Grosenick, 1995; Kindzierski, O’Dell, Marable, & Raimondi, 2013). They may feel unable to manage complex issues associated with this
population and are therefore susceptible to workplace burnout and attrition (Adera & Bullock, 2010; George et al., 1995). Further compounding this problem is the fact that students with emotional and behavioural disorders are often taught by the least prepared and least experienced teachers (Wehby et al., 2003).

In Ontario, Canada, teachers wishing to work in special education must complete one additional qualification course; however, this course does not specifically focus on students with behavioural disorders (Dworet & Maich, 2007). Teachers working in general education may also take this additional qualification course in order to help them better meet the needs of exceptional pupils who have been integrated into their mainstream classrooms (Killoran et al., 2013).

In a recent two-day consultation meeting at the Ontario College of Teachers, 24 members of the teaching profession and university faculty in special education gathered to review possible revisions to Ontario’s special education coursework (Killoran et al., 2013). This discussion identified the need for teachers to acquire a more complete understanding of behavioural exceptionalities, and suggested that teachers would likely benefit from resources to improve their ability to manage incidents related to student problem behaviour (Killoran et al., 2013).

Given the recognized need for improvements in teacher education, Ontario’s Ministers of Education and Training, Colleges and Universities recently announced widespread changes to Ontario’s initial teacher education programs. Beginning in 2015, Ontario’s initial teacher education programs will be doubled to four semesters (two years) and the minimum practicum requirement will be doubled to 80 days (Duguid & Sandals, 2013). There will also be new mandatory core elements in all training programs,
providing all pre-service teachers with some training in working with students of diverse background and with special needs (Ontario College of Teachers, 2013). By increasing the length of the training program, new teachers will hopefully be better prepared in effective classroom management practices and feel more comfortable working with exceptional pupils.

1.6 Reactive Classroom Management

Reactive classroom management refers to behaviour management procedures that are implemented by teachers in response to undesirable student behaviour. These strategies, which are intended to immediately terminate problem behaviour through the use of aversive consequences, include reprimands (use of disapproving statements), time-outs (placing a student in a non-reinforcing environment for a brief period of time following the occurrence of a problem behaviour), and response cost (a component of a token economy system in which a student loses points, tokens, or privileges for misbehaviour; Reinke et al., 2011).

Teachers commonly resort to using reactive techniques when attempting to manage students’ problem behaviour (Clunies-Ross et al., 2008; Ducharme & Shecter, 2011; Maag, 2001; Martin et al., 1999; Poulou & Norwich, 2000). For example, in a recent study examining the classroom management practices of American teachers, Little and Akin-Little (2008) found that 83% of teachers reported using verbal reprimands; similarly, 74% of teachers in Greece reported using this procedure (Akin-Little, Little, & Laniti, 2007). A recent investigation of the classroom management practices of Australian and Canadian pre-service teachers indicated that they were more likely to use corrective strategies (e.g., saying a student’s name as a warning or removing privileges)
than preventative strategies or rewards (Reupert & Woodcock, 2011).

Although most teachers indicate preference for more positive approaches when surveyed (Elliott, Witt, Galvin, & Peterson, 1984; Poulou & Norwich, 2000), many continue to rely on reactive strategies in practice because they are quick, easy to administer, and may provide temporary relief from disruptive behaviours (Maag, 2001; Lerman & Vorndran, 2002). These reactive approaches may provide short-term suppression of problem behaviour, but they rarely lead to long-term gains (Ducharme, 2007; Maag, 2001; Mayer, 1995). Moreover, such strategies do not teach students positive responses that they can use as alternatives to their problem behaviour (Bear, 1998; Maag, 2001; Witt, VanDerHeyden, & Gilbertson, 2004).

Reactive techniques may also give rise to a number of unintended negative side effects. First, when teachers engage in reactive classroom management, they may be modelling negative and coercive strategies for achieving desired outcomes, increasing the odds that children make use of such negative strategies in their own social interactions (Patterson, 1982; Patterson, DeBaryshe, & Ramsey, 1989; Shores, Gunter, & Jack, 1993; Silver, Measelle, Armstrong, & Essex, 2005). Second, reactive procedures may serve as a reinforcement rather than a punishment for some students, thereby increasing the likelihood of future misbehaviour (Gunter, Denny, Jack, & Shores, 1993; Maag, 2001; Mayer, 2001). For instance, placing a student in time-out when he or she is engaging in problem behaviour to escape an unpleasant situation (e.g., challenging academic work) will likely serve to reinforce the problem responding. Third, when teachers frequently use reactive strategies, students may habituate to the punitive consequences, requiring teachers to employ even more frequent and harsher forms of discipline (Skiba &
Peterson, 2000). This may lead to students viewing their teachers as unfair and overly punitive and may damage the teacher-student relationship (Bear, 1998; Lee, 2005; Lewis, Romi, Qui, Katz, 2005). Finally, prolonged use of reactive classroom management may contribute to additional teaching stress and further use of reactive techniques (Clunies-Ross et al., 2008).

1.7 Proactive Classroom Management and Positive Behaviour Support

In recent years, there has been a growing recognition of the need for more positive and proactive forms of behaviour management in educational settings (Chitiyo, May, & Chitiyo, 2012; Solomon, Klein, Hintze, Cressey, & Peller, 2012). Proactive classroom management addresses many of the concerns associated with reactive approaches, offering a more positive and effective method for managing student behaviour. Proactive approaches involve supportive strategies focused on preventing problem behaviours, managing minor problems before they escalate, and teaching positive alternatives to problem responses (Evertson & Poole, 2008; Safran & Oswald, 2003). Although proactive classroom management clearly requires preparatory work, this effort is rewarded with fewer problem behaviours in the classroom (Evertson & Poole, 2008). In turn, this facilitates students’ academic learning and social-emotional growth (Evertson & Weinstein, 2006).

In educational settings, Positive Behaviour Support (PBS; Horner et al., 1990; Sugai & Horner, 2002; Sugai et al., 2000) has emerged as the most highly regarded and empirically-supported form of proactive behaviour management (Chitiyo et al., 2012; Solomon et al., 2012). PBS “refers to the application of positive behavioural interventions and systems to achieve socially important behaviour change” (Sugai et al.,
In an educational context, PBS has evolved into a school-wide approach for preventing problem behaviours and promoting prosocial behaviours (Safran & Oswald, 2003; Solomon et al., 2012; Sugai & Horner, 2002).

School-wide PBS is typically administered through a comprehensive three-tier support system (Sugai et al., 2000; Sugai & Horner, 2002; Walker et al., 1996). Primary prevention, the first level of support, focuses on reducing new incidents of problem behaviour through the use of universal, school-wide intervention (Sugai et al., 2000). This involves creating a positive school environment with clear expectations and effective disciplinary procedures (Walker et al., 1996). Examples of primary prevention strategies include establishing school-wide core values, teaching conflict resolution strategies to the entire school, and consistently emphasizing skills for academic success (e.g., arriving to class prepared and completing homework; Solomon et al., 2012; Walker et al., 1996). Although this school-wide prevention approach is intended to ensure that all students remain on positive academic and behavioural trajectories (Walker et al., 1996), it is most effective for the 80% of students who do not display serious conduct problems (Sugai & Horner, 2002).

For those students who do not respond to primary prevention, a second level of support is required (Sugai & Horner, 2002; Walker et al., 1996). Secondary prevention aims to reduce incidents of problem behaviours by providing specialized group intervention and support to the 15% of students who are at-risk for, but not yet demonstrating, serious problem behaviour and school failure (Sugai et al., 2000; Sugai & Horner, 2002; Walker et al., 1996). This type of prevention may involve the use of anger-management groups, social skills groups, adult mentoring, or the participation in
specialized academic remediation programs (Walker et al., 1996).

The third and final level of support is tertiary prevention, which provides specialized individual intervention to the 5% of students who display long-standing histories of severe antisocial behaviour (Sugai et al., 2000; Sugai & Horner, 2002; Walker et al., 1996). Tertiary prevention aims to reduce the frequency and intensity of these problem behaviours by employing a comprehensive and collaborative approach that involves students, parents, teachers, administrators, and school support staff (Walker et al., 1996). The development of these highly individualized interventions typically begins with a functional assessment, a process that explores the antecedents and consequences of a behaviour to determine its function (Gresham, 2004; Horner, 1994).

Functional assessment relies on a variety of procedures, including interviews, rating scales, observations, and historical records (DuPaul & Ervin, 1996; Gresham, 2004). It may also include a procedure known as functional analysis, the direct experimental manipulation of environmental variables to test whether specific factors are associated with the maintenance of problem behaviour (DuPaul & Ervin, 1996; Horner, 1994; Vollmer & Northup, 1996). For example, to determine whether a student’s disruptive behaviour is an attempt to escape challenging academic work, a functional analysis could involve systematically varying the level of academic demand to see whether the problem behaviour co-varied with the level of academic challenge or interest.

Once a functional assessment is completed and the function of a problem behaviour established, this information can be applied to the development of effective tertiary interventions (Horner, 1994; Lewis & Sugai, 1996). One type of intervention that may be derived from a functional assessment relates directly to the concept of functional
equivalence, the notion that two topographically different behaviours may serve the same function or purpose (Carr, 1988; Carr & Durand, 1985). As an intervention strategy, students may be taught functionally equivalent replacement behaviours (i.e., prosocial alternative responses for accessing the same desired result; Carr, 1988; Ducharme, 1999, 2000). For instance, if the function of a student’s acting out behaviour is to escape challenging academic work, then he or she may be taught to ask for a break or assistance as a means of achieving this goal in a more positive way.

Although functional assessment is a key element in PBS interventions, there are a number of barriers that have prevented functional assessment from being consistently applied in classrooms (Ducharme & Shecter, 2011; Gresham, 2004). In particular, this approach requires a large time commitment and significant resources, as teachers must conduct individualized functional assessments and interventions for each student with challenging behaviour (DuPaul & Ervin, 1996). Although such specialized interventions may be beneficial to the few students who receive them, teachers do not typically have the time and resources available to provide such extensive individualized attention to each student in need of support. Thus, many of the students requiring assistance may not receive the supports they need (Adelman & Taylor, 2002).

An additional concern relates to the complexity of functional assessment and the specialized expertise required to effectively use this approach. Determining the functions of a behaviour may be a complicated task given that problem behaviour is highly idiosyncratic and that a behaviour’s topography is rarely indicative of a behaviour’s function (Lewis & Sugai, 1996; Vollmer & Northup, 1996). Therefore, two students who engage in the same problem behaviour may do so for very different reasons and may
require distinctive interventions (Vollmer & Northup, 1996). For example, one student may make disruptive comments and jokes during a lesson to gain peer attention, whereas another student may engage in the same behaviour as a means of avoiding a challenging academic situation. Thus, despite the behavioural similarity, the functionally-derived intervention for these two responses may be different.

Functional assessment is further complicated by the fact that problem behaviours may have multiple functions and maintaining variables (Lewis & Sugai, 1996; Witt et al., 2004). It may therefore be particularly challenging to isolate the specific factors contributing to each child’s problem behaviour. In response to this concern, Ducharme and Shecter (2011) noted, “isolating multiple functions and multiple maintaining variables for multiple behaviours across multiple children becomes little more than a pipe dream with the limited resources available in most schools” (p. 260). Thus, notwithstanding the many benefits of PBS and functional assessments, schools appear to be in need of simpler and more practical forms of proactive intervention.

1.8 Keystone Intervention

Keystones are specific skills that, when learned, are likely to engender a wide range of other positive outcomes (Barnett, Bauer, Ehrhardt, Lentz, & Stollar, 1996). Thus, by targeting a single core behaviour, it is possible to produce positive changes in many other areas (Lalli, Kates, & Casey, 1999; Rincover, 1981). From a practical perspective, teaching keystone responses directly may require less time, planning, and financial support than interventions requiring functional analysis before skill training is initiated (Ducharme & Shecter, 2011).

Keystone behaviours are related to the concept of response covariation, the notion
that changes in the probability of one behaviour occur as a result of the changes in the probability of another behaviour (Sprague & Horner, 1992). This behavioural covariation may occur due to functional equivalence between keystones and problem behaviours; that is, keystone behaviours and problem responses may provide access to similar functional outcomes (Carr, 1988; Ducharme, 2000; Ducharme & Shecter, 2011; Gresham, 2011). Thus, if an individual learns to access a particular class of reinforcement through demonstration of a prosocial keystone skill, then functionally equivalent problem behaviours will decline, as the individual has adopted an alternative and more socially acceptable means of achieving the desired outcomes. For example, communication and problem behaviour are often considered to be functionally equivalent, as both provide a mechanism for conveying information about one’s desires or needs (Carr & Durand, 1985). Thus, when children’s communication skills are enhanced, problem behaviour often becomes unnecessary.

In their conceptual model for proactive classroom management, Ducharme and Shecter (2011) proposed a keystone approach to classroom intervention that involves focusing on core skills that are required for success in the school environment: compliance, social skills, on-task behaviour, and communication. Demonstration of component skills in each of these four keystone areas leads to many positive outcomes for students (e.g., positive teacher attention, good peer relations, and academic success) as well as reductions in student problem behaviour. For this reason, a classroom management approach focusing on these four areas would likely produce widespread and generalized treatment effects (Gresham, 2011).

**Compliance.** Compliance reflects an individual’s willingness to follow directives
from authority figures. In school, a student’s ability to comply with teacher requests is essential to their school success and adjustment, allowing the student to successfully engage with the teacher and the curriculum (Ducharme, 2007; Gresham, 2011). In contrast, noncompliance often leads to conflict between teachers and students, potentially causing damage to the teacher-student relationship (Bear, 1998). Unfortunately, student non-compliance is prevalent in school settings (Lane, Wheby, & Cooley, 2006; McMahon & Forehand, 2003) and is the most common reason for office discipline referrals (Colvin, 2009).

Much research suggests that compliance is a keystone skill (Ducharme & Shecter, 2011); when compliance is increased through intervention, many other behavioural improvements occur (e.g., Ducharme & Ng, 2012; Ducharme et al., 1994; Ducharme & Popynick, 1993; Johnson-Gros & Shriver, 2006; Matheson & Shriver, 2005; Parrish, Cataldo, Kolko, Neef, & Egel, 1986; Piazza et al., 1997; Russo, Cataldo, & Cushing, 1981). Given that non-compliance is problematic among students with behavioural disorders (Colvin, 2009), compliance training may be particularly useful for these students.

**Social skills.** Social skills can be defined as socially appropriate learned behaviours that facilitate effective communication and positive interactions with others (Gresham & Elliott, 1984). These skills serve as the backbone of social competence, allowing an individual to develop meaningful relationships and function successfully in a wide range of social situations (Choi & Kim, 2003; Gresham, Sugai, & Horner, 2001; Hughes & Sullivan, 1988). The development of appropriate social skills is a key ingredient for school success (Ducharme & Shecter, 2011). However, not all children
succeed in learning these important skills, placing them at risk for a range of poor psychosocial outcomes including antisocial behaviour, peer rejection, poor academic achievement, school dropout, criminality, and psychopathology (Cartledge & Milburn, 1978; Coie & Dodge, 1983; Contreras, Molina, & Cano, 2011; French & Conrad, 2001; Gresham, 1988; Ogilvy, 1994; Parker & Asher, 1987; Segrin, 1996, 2000).

As noted by Ducharme & Shecter (2011), social skills training programs have been shown to improve social competence and generate keystone improvements in problem behaviours and academic engagement (e.g., Koegel, Koegel, Hurley, & Frea, 1992; Lane et al., 2003; Loftin, Odom, & Lantz, 2008; Lösel & Beelmann, 2003). Moreover, Ducharme and colleagues have established some initial evidence to suggest that the social skill of acquiescence (i.e., the ability to give in or “flex” with the needs of others) may be a specific keystone within the larger category of social skills for producing covariant improvements in both peer interactions and problem behaviours (Ducharme & Conn, 2007; Ducharme, Folino, & DeRosie, 2008). Thus, focusing intervention on social skills development and, more specifically, acquiescence, may be an effective and efficient way of promoting widespread behavioural change in students with challenging behaviour.

**On-task behaviour.** On-task behaviour refers to a student’s ability to remain focussed and engaged in tasks that are relevant to academic learning (Bloom, 1974; Caldwell, Huitt, & Graeber, 1982). In the classroom, on-task behaviour is essential to academic success (Bloom, 1974; Carroll, 1963), as the amount of time students spend actively engaged in learning is positively correlated with academic achievement (Caldwell et al., 1982; Cobb, 1972; Fisher et al., 1980; Fredrick, 1977; Gettinger, 1986;
In several research studies, interventions targeting on-task responding have produced covariant improvements in academic achievement and reductions in disruptive behaviour, lending support to the view that on-task behaviour is a keystone skill (e.g., Ducharme & Harris, 2005; Ducharme, Lucas, & Pontes, 1994; Wood, Murdock, Cronin, Dawson, & Kirby, 1998). The development of on-task skills may be particularly important for students with behavioural challenges, given that they tend to display lower levels of academic engagement than their typically developing peers (Ducharme & Shecter, 2011; Shinn, Ramsey, Walker, Stieber, & O’Neill, 1987).

**Communication skills.** Communication refers to the ability to express oneself and share information with others (Rosengren, 2000). In school settings, communication skills play a vital role in students’ academic and social success, allowing them to exchange information with teachers and peers and to access desired outcomes in an effective manner. However, many children struggle with communication problems (Thatcher, Fletcher, and Decker, 2008) and engage in problem behaviour as a means of expressing themselves or accessing particular outcomes (Carr & Durand, 1985; Durand, 1990; Freeman, 1993).

A wide range of studies have demonstrated that improving communication skills often leads to decreases in problem behaviour (e.g., Carr & Durand, 1985; Durand & Crimmins, 1987; Durand & Merges, 2001; Harding, Wacker, Berg, Lee, & Dolezal, 2009; Peck Peterson et al., 2005). In fact, functional communication training, in which an individual is taught functionally equivalent communicative responses, is an empirically supported treatment for problem behaviour (Kurtz, Boelter, Jarmolowicz,
Chin, & Hagopian, 2011; Mancil, 2006). Given that children and adolescents with behavioural disorders commonly show impairments in social communication, language skills, and verbal ability (Gilmour, Hill, Place, & Skuse, 2004; Hill, 2002; Nigg & Huang-Pollock, 2003; Speltz, DeKlyen, Calderon, Greenberg, & Fisher, 1999), developing communication skills in these students may be an effective form of intervention.

1.9 Errorless Remediation

Errorless remediation is a collection of proactive and success-focused procedures that are used to increase prosocial behaviour and reduce externalizing behaviour problems in children. Research studies evaluating the effectiveness of errorless remediation have demonstrated marked behavioural improvements in children with behavioural disorders (e.g., Ducharme, Folino, & DeRosie, 2008; Ducharme & Harris, 2005; Folino, Ducharme, & Conn, 2008), developmental disabilities (e.g., Ducharme, DiPadova, & Ashworth, 2010; Ducharme & DiAdamo, 2005; Ducharme, Harris, Milligan, & Pontes, 2003), and autism spectrum disorders (e.g., Ducharme & Drain, 2004; Ducharme, Lucas, & Pontes, 1994; Ducharme, Sanjuan, & Drain, 2007). Moreover, errorless procedures have been successfully introduced into community schools (e.g., Ducharme & DiAdamo, 2005; Ducharme & Ng, 2012; Folino et al., 2008).

The word “errorless” is used to describe these procedures due to their theoretical similarity to errorless discrimination training, a teaching process during which an individual is taught to make difficult discriminations while making few or no errors (Ducharme, 2000, 2008; Stoddard & Sidman, 1967; Terrace, 1966; Touchette, 1968). With errorless discrimination training, prompts are used to simplify difficult
discriminations for the learner, allowing the individual to respond at a near perfect (i.e., errorless) level. Prompts are gradually withdrawn at a slow enough rate to allow the individual to continue responding with few to no errors, even after all prompts are terminated (Egeland, 1975; Terrace, 1963).

Errorless remediation is conceptually similar to errorless discrimination training in its introduction and gradual fading of prompts and other supports to assist children in dealing with challenging situations that often lead to problem behaviour (Ducharme, 2008). Initially, the child is provided with intensive assistance in managing difficult conditions commonly associated with conduct issues, resulting in substantial reductions in problem behaviour (in errorless remediation, behaviour problems are treated as “errors”). These supports are gradually withdrawn, exposing the child to increasingly challenging conditions, but at a slow enough rate that problem behaviours remain at low levels (Ducharme, 2008). By the end of treatment, the child has learned to tolerate demanding situations and no longer needs problem responses to manage these conditions (Ducharme, 2000). Both errorless remediation and errorless discrimination training are based on the same operant learning principles, including stimulus control, stimulus fading, differential reinforcement, and extinction (Ducharme, 2000; Skinner, 1938).

1.10 Errorless Classroom Management

Although errorless remediation is most often used in research studies as an individualized or small group intervention, Ducharme (2007) suggested that these proactive procedures could also be applied at a class-wide level, in the form of errorless classroom management (ECM). As part of ECM, students develop prosocial skills (e.g., compliance, social skills including acquiescence, on-task behaviour, and communication
skills) while building tolerance to demanding classroom situations that formerly led to problem behaviour. As with other errorless approaches, this goal is achieved in ECM by (a) using supports to moderate problem behaviour and ensure student success, (b) reinforcing successful responding that occurs under these supported conditions, and (c) increasing demand systematically (Ducharme, 2007). This three-step process provides a conceptual framework for teachers using ECM to manage their classrooms.

**Moderating behaviour for student success.** To reduce problem behaviour and promote student success, teachers can moderate student behaviour by making challenging situations less aversive and introducing conditions associated with positive student behaviours (Ducharme, 2007, 2008). In the initial phase of ECM, the classroom teacher uses moderating strategies to achieve the “errorless level”, that is, the lowest possible level of problem behaviour (Ducharme 2003, 2007). These moderating approaches are applied to core keystone areas (e.g., compliance, social skills, on-task behaviour, communication) using three main techniques: antecedent strategies, ecological strategies, and rapport.

**Antecedent strategies.** Antecedent factors are environmental conditions or events that are present before or during a particular behavioural episode (Ducharme, 2008). Classroom problem behaviours typically occur in the context of specific challenging antecedent conditions, such as teacher requests, transitions, and demanding academic tasks (Ducharme, 1999). In these situations, students often misbehave to obtain a desired outcome (e.g., throwing a tantrum at the end of a free play period to get more time to play) or to avoid aversive circumstances (e.g., engaging in disruptive or aggressive behaviour during an academic work period to avoid tackling a difficult assignment;
Ducharme, 2008). Students will continue to use these antisocial strategies so long as their behaviour leads to the desired result (e.g., additional play time or avoiding academic work; Ducharme, 2008).

Once the antecedent factors associated with a problem behaviour have been established, environmental conditions can be altered to promote prosocial behaviour and/or prevent maladaptive responding (Kern & Clemens, 2007). Antecedent strategies can include altering academic demands to make schoolwork simpler or more enjoyable, changing seating arrangements, providing students with choices, and establishing effective classroom rules and predictable routines (Ducharme, 2007; Kern & Clemens, 2007). Strategies commonly used to alter antecedent conditions in the classroom include prompting (cuing statements or gestures such as a hand in the air while posing a question to the class), priming (preparatory statements such as a five minute notice of an upcoming transition), and high probability requests (directives that typically yield compliance such as “help me hand out these papers”; Ducharme, 2007; Kern & Clemens, 2007).

**Ecological strategies.** Ecological factors include physiological and emotional variables that hold a powerful influence over student behaviour (Ducharme, 2008). For instance, students may be affected by physiological discomfort (e.g., hunger, fatigue, or pain) and emotional issues (e.g., distress due to family violence, parental divorce, abuse, or bullying), rendering already demanding classroom situations even more challenging to manage (and more likely to promote problem responses focused on escaping the aversive conditions; Ducharme, 2007).

Strategies designed to address ecological variables may include providing snacks
or breakfast programs to children who come to school hungry, or meeting with parents 
about a student’s home routine to help increase sleep hygiene and combat daytime fatigue 
(Ducharme, 2007). Some ecological strategies may require the support of other 
professionals or external agencies. For example, consultation with a physician may allow 
a student to obtain necessary medical treatment to address illness or pain, or involvement 
of child protective services may be essential for a student living in an abusive or 
neglectful home.

**Rapport.** One of the simplest and most effective strategies a teacher can use to 
moderate student behaviour involves fostering good rapport (i.e., supportive, empathic, 
warm, and caring teacher-student relationships; Ducharme, 2008). When students have 
warm relationships with their teachers, they are more likely to work hard and put forth 
effort to please their teachers (Abidin, Greene, & Konold, 2004). Children are also more 
likely to model an adult’s behaviour if the adult is warm and nurturing (Bandura, 1969). 
Additionally, teacher praise and commendation may be a more potent source of positive 
reinforcement when good rapport has been established (Levine & Ducharme, 2013). 
Moreover, good rapport may help to manage ecological variables, as positive teacher-
student relationships help to create an environment where students are comfortable 
discussing personal difficulties with their teacher (Ducharme, 2007, 2008).

Developing rapport with students may be as simple as taking some time each day 
to engage students in a warm conversation (Ducharme, 2007). Teachers may also foster 
good rapport and improve student behaviour by taking time to play with a child for just a 
few minutes a day (Corrigan, 2006; Ducharme & Rushford, 2001; Levine & Ducharme, 
2013). Even an action as simple as welcoming students with an individualized greeting
and positive statement each morning has been shown to improve on-task behaviour (Allday & Pakurar, 2007). Research studies suggest that high quality teacher-student relationships characterized by strong emotional support and sensitivity may moderate academic failure and behaviour problems (e.g., Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Hamre & Pianta, 2001, 2005).

**Reinforcing successful responding.** Once students begin to demonstrate high levels of successful responding by means of moderating techniques, teachers need to maintain these prosocial behaviours through the use of praise and other forms of positive reinforcement (Ducharme, 2007). Although praise and commendation may be effective at maintaining prosocial behaviour for many students (especially when the teacher has made efforts to establish rapport with them), some may require more potent forms of reinforcement (Ducharme, 2007, 2008; Partin, 2009). Teachers may choose to reward prosocial behaviour through tangible rewards (e.g., activities, treats) or reward systems (e.g., points, stickers, star charts; Ducharme, 2008).

**Increasing demand systematically.** Although moderating and reinforcement strategies are important tools for building prosocial behaviour and discouraging problem behaviour, it is often impossible for teachers to sustain such supports for extended periods of time (Ducharme, 2007). Moreover, students need to eventually build tolerance for and learn to manage challenging conditions with less extensive support from teachers (Ducharme, 2007). As such, the third component of ECM involves gradually fading teacher supports and increasing academic and other demands on students (Ducharme, 2007). As with all errorless protocols, this fading process occurs at a slow enough rate to ensure that students continue to experience success in managing classroom challenges.
1.11 The Current Study

In the present study, we introduced ECM into a special education classroom for students with severe externalizing behaviour. Classroom staff members were taught ECM strategies and how to apply them to four keystone areas: compliance, social skills (with a specific focus on acquiescence), on-task behaviour, and communication. These specific keystones were selected due to their ability to promote school success (Ducharme & Shecter, 2011) and the fact that children with problem behaviours typically display deficits in these core areas (Colvin, 2009; Gilmour et al., 2004; Shinn et al., 1987; Spence, 2003). The goal of the current study was to alter classroom management practices in a manner that would promote covariant improvements in student behaviour.

We hypothesized that participation in the ECM training program would lead to a reduction in staff members’ use of reactive classroom management practices and an increase in their use of proactive classroom management strategies. We also predicted that the anticipated changes in staff behaviour would lead to covariant improvements in student problem behaviour, prosocial behaviour, compliance, acquiescence, and on-task behaviour. Finally, we anticipated that the ECM training program would lead to strong social acceptability ratings, reductions in staff stress levels, and improvements in students’ social competence and behavioural functioning, as measured by staff-report questionnaires.
Chapter 2: Method

2.1 Classroom Setting

The present study was conducted in a special education classroom for students with severe antisocial behaviour. Seven male students in Grades 1, 2, and 3, were enrolled in this classroom, which was located within a publicly funded elementary school in metropolitan Toronto. This school also offered mainstream education for students in kindergarten through Grade 5 as well as a variety of other special education programs for students with physical, intellectual, and developmental disabilities.

2.2 Participants

**Staff.** For the first 4.5 months of the school year, the classroom was staffed by one full-time special education teacher, one full-time educational assistant, and one part-time educational assistant. However, near the start of the fifth month of the school year (prior to commencement of baseline observations of staff members), the part-time educational assistant was reassigned to another classroom. This staffing change reduced supports within classroom and created additional work for the remaining classroom staff members, who frequently struggled to find time to eat lunch or to take a short break to use the washroom.

Although consent was originally provided by all three classroom staff, only the two full-time staff members participated in the present study due to the aforementioned staffing reassignment. The classroom teacher had taught for 20 years in special education programs for students in grades 1 through 8, and the full-time educational assistant had assisted in special education programs for 21 years, working with students from kindergarten through grade 11. Both participants were female.
**Students.** Consent was obtained to conduct live observations for six of the seven students in the classroom. The student participants were six boys (aged 6 to 8 years at baseline) who demonstrated extremely severe externalizing behaviour, including physical violence and verbal aggression. These students also displayed substantial difficulty attending to academic work, engaging cooperatively with peers, regulating challenging emotional states, and complying with staff directions. Two students were previously diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) by a clinical psychologist. One of these children was also diagnosed with Oppositional Defiant Disorder (ODD). The other four children were unable to undergo formal psychological evaluations due to lengthy waitlist times, lack of parental consent, or extreme oppositional behaviour.

**2.3 Research Design**

The present study used a quasi-experimental interrupted time-series design (Marczyk, DeMatteo, & Festinger, 2005; Posavac & Carey, 1997) to evaluate the effectiveness of the ECM intervention in a self-contained behavioural classroom. As per the requirements of this design, we conducted multiple observations of each participant prior to and following the implementation of the intervention (Hersen & Barlow, 1976). The use of repeated measurements across multiple participants enabled us to distinguish between random variation and systematic behavioural change (Fitzpatrick, Sanders, & Worthen, 2011; Posavac & Carey, 1997). Given our access to only one behavioural classroom and the severity of problem behaviours within this classroom, the single-case interrupted time-series design proved to be the best balance of practicality, external validity, and experimental control.
2.4 Dependent Measures

We employed a combination of observational and staff-report data in this study. Live observations of classroom staff provided a measure of their use of classroom management strategies; observations of students provided objective information about their behaviours within the classroom. Finally, staff-report data provided a measure of social validity (Wolf, 1978) for the ECM training program.

**Staff classroom management strategies.** We used a live-observation coding system to measure staff members’ use of classroom management strategies (see Appendix A for sample coding sheet). Each observation session involved 30 minutes of observing staff members while they engaged in typical classroom activities (e.g., providing academic instruction and supervising play periods). During this time, event recording was used to document staff members’ use of reactive and proactive classroom management procedures.

**Reactive strategies.** The frequency of staff members’ reactive strategies served as the first dependent measure of classroom management skills. Reactive strategies were defined as negative staff behaviours that occurred in response to a child’s undesirable behaviour as a means of managing or terminating the problem child response. Reactive procedures included (a) verbal reprimands (responding to student problem behaviour with a negative or disapproving statement), (b) threats (threatening students with negative consequences), (c) withdrawing privileges (removing tangible rewards or privileges), (d) time-outs (sending a student to a solitary location for a designated period of time), and (e) physical force and restraints (using physical coercion to move or constrain a student).
**Proactive strategies.** The frequency of staff members’ proactive strategies served as the second dependent measure of classroom management skills. Proactive strategies were defined as positive staff behaviours that followed the ECM protocol and were intended to promote prosocial student responses. Proactive procedures encompassed both moderating and reinforcing strategies and included (a) prompts (providing leading cues to guide a student towards a correct behaviour), (b) primes (preparing a student for an upcoming challenge), (c) modeling and role-play (demonstrating and practicing appropriate behaviour through skits and exercises), (d) praise (recognizing a student’s positive behaviour through positive verbal statements), and (e) rewards (recognizing a student’s positive behaviour through the provision of a reward).

**Student behaviour.** Two distinct live-observation coding systems were used to measure student behaviour. The first was an event recording approach, in which students were observed for 60 minutes while they engaged in typical classroom activities (e.g., free play, circle time, academic work, and lunch). During this time period, all incidents of students’ problem behaviour, prosocial behaviour, compliance, and acquiescence were recorded as they occurred (see Appendix B for sample coding sheet).

The second coding system was used to assess student on-task behaviour. This involved a forced-choice interval system, in which students were observed for approximately 5 minutes during an academic work period. Each observation session was segmented into thirty 10-second intervals. For each interval, an observer recorded whether the student spent the majority of time on-task, off-task, or engaged in a neutral activity, defined below (see Appendix C for sample coding sheet). However, because academic work periods were brief, irregular, and occasionally terminated early due to the
frequency and severity of child problem behaviour in the classroom, a number of
observation sessions were unexpectedly cut short. As a result, 83% of on-task observation
sessions were exactly 5 minutes in length, 7% of sessions were 4 to 5 minutes in length,
and 10% of sessions were 3 to 4 minutes in length.

**Problem behaviour.** The frequency of problem behaviours was the first
dependent measure of student behaviour. Problem behaviour was defined as any actions
or statements that were antisocial, aggressive, or disruptive in nature. This measure
included negative verbal behaviour (e.g., threatening, teasing, or insulting), negative
physical behaviour (e.g., hitting, kicking, or destroying property), and disruptive
behaviour (e.g., calling out, running around the classroom, or making silly noises during
academic work periods).

**Prosocial behaviour.** The frequency of prosocial behaviours was the second
measure of student behaviour. Prosocial behaviours included all self-initiated actions or
statements that fostered positive interactions with staff and other students. This measure
included both positive verbal statements (e.g., thanking, apologizing, or complimenting)
as well as positive physical actions (e.g., spontaneously sharing a toy, raising a hand to
ask a question, or helping some who had fallen).

**Compliance.** Percentage of compliance was our third measure of student
behaviour. Compliance was defined as initiating an appropriate response to a staff
member’s request within 10 seconds and following through on the completion of the task
within a reasonable period of time. Although we recorded the compliance of each
student to individual requests (commands directed to a particular student) and group
requests (commands directed to the entire class) separately, we ultimately collapsed these
categories into a single measure representing overall compliance due to the limited number of group requests. Thus, overall compliance was calculated by dividing the total number of compliant responses by the total number of requests and multiplying by 100.

Of note, compliance scores were generated only for individual observation sessions in which a student was issued at least two requests. This criterion ensured that session scores were not represented by a single occurrence of compliance or non-compliance, which would have rendered them less valid measures of sessional compliance. In total, compliance data from four sessions (one from each of Child 1, Child 2, Child 4, and Child 6) were excluded from analyses due to this criterion.

**Acquiescence.** Percentage of acquiescence was our fourth measure of student behaviour. Acquiescence was defined as giving in or “flexing” to the needs and will of a peer to foster positive social interactions, a process that requires the ability to occasionally subordinate one’s own needs for the benefit of others. Throughout observations, acquiescent events were most often seen in two forms. In the first form, an acquiescent event began when a peer presented a demand or directive to the target child, for example, requesting that the child share a particular toy. In this case, acquiescence involved complying or going along with the demand or directive, whereas non-acquiescence involved disregarding or refusing to comply with the request. The second type of acquiescent event began with a mild peer provocation, for example, one child taking another’s toy without permission. In this case, acquiescence involved tolerating the provocation without demonstrating antisocial behaviour (i.e., ignoring the provocation or responding to it with an appropriate response such as calmly asking the child not to take other toys); non-acquiescence involved responding with an antisocial
outburst. We calculated acquiescence as a percentage: the number of acquiescent responses divided by the total number of acquiescent events, multiplied by 100.

Like compliance, acquiescence scores were generated only for individual observation sessions in which a student was confronted by a minimum of two acquiescent events. This criterion ensured that session scores were not represented by a single occurrence of acquiescence or non-acquiescence, which would have rendered them less valid measures of sessional acquiescence. In total, acquiescence data from a total of four sessions (two from Child 1 and two from Child 4) were excluded from analyses due to this criterion.

**On-task behaviour.** Percentage of on-task behaviour served as the final observational measure of student behaviour. Students were considered to be on-task when they spent more than half of the 10 second interval actively engaged in an academic task, demonstrating observable actions directly related to the task at hand (e.g., writing, counting, cutting, or gluing). Students were considered off-task when their attention was clearly not on their assignment for more than half the interval (e.g., talking to peers, leaving their seat without permission, or looking around the classroom). Finally, when student behaviour was ambiguous to the observer for more than half the interval (e.g., staring at a worksheet with no output), the response was categorized as neutral. We calculated on-task behaviour as a percentage: the number of on-task intervals divided by the total number of intervals, multiplied by 100.

**Social validity measures.** Social validity is a construct referring to the importance and acceptability of treatment goals, procedures, and outcomes (Kazdin, 1977; Wolf, 1978). To determine whether treatment outcomes were socially valid, that
is, whether the intervention produced meaningful changes in the lives of participating staff and students, we employed four staff-report measures: a classroom management stress scale, the Index of Teaching Stress (ITS), a satisfaction survey, and the Behavior Assessment System for Children – Second Edition – Teacher Rating Scales (BASC-2-TRS).

**Classroom management stress scale.** Staff members’ stress related to overall classroom management was measured using an informal rating scale. Each time the author visited the classroom, both staff members independently rated their daily stress levels due to behaviour management from 0 (no stress) to 10 (extreme stress). This measure provided time-series information about the stress of managing an entire classroom of students with severe behavioural difficulties.

**Index of Teaching Stress (ITS).** The ITS (Abidin, Greene, & Konold, 2004) is a 90-item questionnaire that provides an indication of a teacher’s stress levels in relation to a particular student. This measure, which uses a five-point frequency scale, taps into three different domains. The first domain is the ADHD scale, which measures student behaviours that are associated with Attention-Deficit/Hyperactivity Disorder (e.g., impulsivity, inattention, restlessness, and social skills deficits). The second domain is the Student Characteristics scale, which comprises four subscales (emotional lability/low adaptability, anxiety/withdrawal, low ability/learning disability, and aggressive/conduct disorder) and measures student characteristics that are typically frustrating and stressful for teachers to manage. The third domain is the Teacher Characteristics scale, which also comprises four subscales (sense of competence/need for support, loss of satisfaction from teaching, disruption of the teaching process, and frustration working with parents) and
measures a teacher’s feelings of hopelessness and ineffectiveness as a teacher. These three domains are then collapsed into a Total Stress score, representing a teacher’s overall stress levels in relation to one particular student.

The ITS, which was normed on a sample of 1448 teachers from the United States, shows evidence of construct, discriminant, predictive, and concurrent validity (Abidin, Greene, & Konold, 2004). The ITS also possesses a high degree of internal consistency, with alpha coefficients for the three domain scales exceeding 0.90 (Abidin, Greene, & Konold, 2004). The internal consistency of the Total Stress index is also very high, with an alpha coefficient of 0.98 (Abidin, Greene, & Konold, 2004).

In the present study, the classroom teacher completed the ITS twice for each participating student, once during baseline and once in the final phase of data collection. The educational assistant did not complete the ITS, as this measure was specifically designed for teachers and the normative data was based on teacher ratings. Therefore, ITS data was obtained only for teacher-student dyads.

**Staff satisfaction survey.** The staff satisfaction survey is an 8-item questionnaire (six closed-ended rating questions using a 5-point ratings scale and two open-ended free response questions) designed to assess staff members’ satisfaction with the training program. This survey served as an indicator of the staff members’ perceptions about the effectiveness of the training program. While the survey was meant to be administered immediately following data collection, it was not administered until eight months following the termination of data collection due to an oversight.

**Scales (BASC-2-TRS).** The BASC-2-TRS (Reynolds & Kamphaus, 2004) is a 139-item questionnaire measuring children’s adaptive and problem behaviours in a school environment, as perceived by their teacher. On this measure, teachers use a four-point frequency scale (never, sometimes, often, almost always) to rate a child on a variety of behavioural descriptors. These ratings are sorted into 15 scales, which are subsequently sorted into five composite scales: 1) Externalizing Problems (includes hyperactivity, aggression, and conduct problems), 2) Internalizing Problems (includes anxiety, depression, and somatization), 3) School Problems (includes attention problems and learning problems), 4) Behavioral Symptoms Index (includes atypicality and withdrawal), and 5) Adaptive Behavior (includes adaptability, social skills, leadership, study skills, and functional communication).

The normative data for the BASC-2-TRS is based on teacher ratings of 1050 preschoolers (aged 2 to 5 years), 1800 children (aged 6 to 11 years) and 1800 adolescents (aged 12 to 21 years). Each teacher provided ratings for a maximum of four students. The BASC-2-TRS demonstrates good internal consistency, with alpha coefficients averaging well above 0.80 and all coefficients at or above 0.75 (Frick, Barry, & Kamphaus, 2010; Reynolds & Kamphaus, 2004). Test-retest reliability for the BASC-2-TRS has been found to be strong and inter-rater reliability has been found to be moderate, with correlations generally higher for externalizing behaviour than for internalizing problems (Frick, Barry, & Kamphaus, 2010). This measure also shows evidence of concurrent and construct validity (Reynolds & Kamphaus, 2004).
In the present study, the classroom teacher completed the BASC-2-TRS twice for each participating student, once during baseline and once during the final phase of data collection. The educational assistant did not complete this questionnaire, as the normative data was based on teacher ratings.

2.5 Data Collection

Observational data were collected by the author and seven volunteer undergraduate research assistants (RAs). Two RAs were responsible for coding staff classroom management strategies as well as student on-task behaviour. Five other RAs were responsible for coding student problem behaviour, prosocial behaviour, compliance, and acquiescence. All coding sessions occurred while staff and students engaged in typical classroom activities (e.g., free play, circle time, academic work, and lunch). Observations occurred in the classroom during regular school hours, spanning across mornings and afternoons. During these sessions, the observers positioned themselves along the perimeter of the classroom, where they were able to unobtrusively record the behaviours of the target staff or student. Throughout the duration of the study, each student was observed an average of once per week, and each staff member was observed an average of 1.5 times per week.

Observer training. All RAs completed a multi-step training program prior to commencing independent observations. First, the RAs received and reviewed a coding manual containing sample coding sheets as well as detailed descriptions of coding procedures and observational measures. Next, they met with the author to review information from the coding manual and to address any questions. In this meeting, the RAs also practiced applying the coding system to hypothetical scenarios presented by the
author. Finally, the RAs shadowed the author in the classroom, coding alongside her and comparing observations. Once each RA was able to demonstrate a minimum of 80% reliability, he or she was permitted to code independently. Throughout the course of the study, the author continued to regularly meet with the RAs (approximately once per week) to review procedures and address any queries or concerns.

**Interobserver agreement.** Interobserver agreement (IOA) was calculated for all three coding systems. For the staff behaviour coding system, 20% of observation sessions (18% of baseline sessions and 22% of post-training sessions) were simultaneously and independently coded by two trained observers. IOA was calculated by dividing the number of agreements by the total number of agreements and disagreements, and multiplying by 100. Mean IOA was 87% (range = 67%–100%) for staff behaviour.

For the event-based student behaviour coding system (i.e., problem behaviour, prosocial behaviour, compliance, acquiescence), 20% of observation sessions (15% of baseline sessions and 24% of post-training sessions) were simultaneously and independently coded by two trained observers. Mean IOA was 91% (range = 74%–100%) for problem behaviour, 94% (range = 71%–100%) for prosocial behaviour, 94% (range = 67%–100%) for compliance, and 90% (range = 67%–100%) for acquiescence.

Finally, for the on-task behaviour coding system, 19% of observation sessions (17% of baseline sessions and 23% of post-training sessions) were simultaneously and independently coded by two trained observers. Unlike the other coding methods, student on-task behaviour used a forced-choice interval coding system. Given that this coding method created the possibility that a certain portion of agreement was due to chance, Cohen’s Kappa was calculated to provide a measure of IOA after controlling for chance.
agreement. In the present study, Kappa was 0.86 (range = 0.59–1.00) for student on-task behaviour.

2.6 Procedure

The present study took place over the course of a 5-month period, commencing mid-January (the fifth month of the academic year) and ending mid-June (the tenth and final month of the academic year). This time period was divided into four study phases: baseline, staff training, Post-training 1, and Post-training 2.

Baseline. Baseline was initiated in January and lasted for approximately seven weeks. During this time, staff members were instructed to interact with students in a typical fashion (as they did before study initiation). All dependent measures were coded during this phase and the author noted specific problematic student behaviour to use as examples during staff training.

Staff training. The staff training program was implemented over the course of two consecutive days in early March. Classroom observational coding was suspended over this training period. On both days, staff participated in 2 hours of didactic training (a total of 4 hours), led by the clinical psychologist who was supervising the present investigation and co-facilitated by the author. As requested by the participating staff members, training occurred at the end of the day in the school’s conference room.

The training began with an overview of reactive and proactive approaches to classroom management. The advantages and disadvantages of both approaches were discussed; however, the long-term benefits of proactive procedures were strongly emphasized. Next, the ECM model of proactive classroom management was introduced. Staff first learned about the theoretical underpinnings of the model, gaining an
understanding of errorless procedures (i.e., moderating the environment to promote student success, reinforcing positive student behaviours, and gradually increasing demand) as well as keystone skills (i.e., compliance, social skill with an emphasis on acquiescence, on-task behaviour, and communication). Later, the psychologist and the author discussed and demonstrated specific strategies for applying ECM in the classroom. Many of the exemplars used within the training program were based on real-life instances of challenging behaviour observed in the target classroom.

To facilitate skill transfer, staff members were provided with a booklet containing copies of the presentation slides, which they were encouraged to review and keep as a comprehensive guide for future reference. They also received a condensed single-page laminated handout focussing exclusively on practical application of the ECM model (see Appendix D for transcribed content). This handout was meant to serve as a quick reference that could be kept in an easily accessible location within the classroom.

**Post-training.** Post-training began three days after the staff-training program was complete and spanned a total of 13 weeks. In this phase, staff were expected to incorporate ECM strategies from the training program into their classroom management repertoire. Post-training was divided into two sub-phases: Post-training 1 and Post-training 2. All dependent measures were coded throughout post-training phases.

**Post-training 1.** In the first phase of post-training, which lasted approximately eight weeks, the author provided extensive in-classroom support to the staff members. Specifically, the author modelled and prompted proactive ECM strategies (e.g., moderating and reinforcement principles), prepared staff for possible upcoming situations in which proactive strategies could be applied, and provided praise and constructive
feedback regarding staff members’ use of these strategies. Support from the author was provided between 1 and 3 days per week (lasting between 2 and 4 hours each day), the extent of which was gradually reduced over the course of this phase. Although the degree of in-classroom support was greater than the investigators had originally anticipated would be necessary, it was essential from a clinical perspective due to the excessive levels of student misbehaviour and the extreme lack of personnel supports and other resources available to staff members in this classroom. At the end of this phase, the supervising psychologist and author led a 1.5 hour booster session in which procedures were reviewed and staff questions were addressed.

**Post-training 2.** In the second phase of post-training, which lasted approximately five weeks, the author provided minimal support to the classroom staff. Although she continued to provide clarification and consultation when requested by staff, she did not proactively moderate and reinforce staff behaviours. Given the severity of the behavioural difficulties characterizing the student participants, problem behaviour unexpectedly continued to remain a challenge during this phase. For this reason, staff were encouraged to continue implementing ECM strategies without engaging in fading procedures. Even with this recommendation, staff members reduced their use of proactive strategies during this time period.

**2.7 Data Analysis**

Given that our study employed a single-case time-series research design, we used visual analysis as the primary method of data analysis. This holistic approach involves graphing data and subsequently examining the results to determine whether systematic changes in behaviour occurred following the introduction of an intervention (Hersen &
Barlow, 1976; Kennedy, 2005; Kratochwill & Levin, 1992). In the present study, we analyzed time-series data by examining the level (i.e., data scores) and variability (i.e., data fluctuation) of outcome measures across study phases. When appropriate, we assessed the rate of improvement (i.e., the speed at which change occurred in relation to intervention initiation) and the magnitude of effect (i.e., shifts in mean scores).

Questionnaire data were examined with the use of descriptive statistics.

While visual analysis is the most common method of analyzing single-case designs, offering conservative estimates of treatment effects (Gast & Spriggs, 2010; Scruggs, Mastropieri, & Regan, 2006), adjunct statistical analysis are sometimes recommended to provide a more objective evaluation of effect size (Busk & Marascuilo, 1992; Parker et al., 2005; Parker & Vannest, 2009). However, in single case research, there are limitations related to the accuracy and generalization of effect sizes, and as such, the field continues to lack consensus about the best methods for deriving effect size estimations (Kratochwill et al., 2010). Acknowledging these limitations, we nevertheless chose to supplement our visual analysis with statistical analysis to obtain an approximate measure of effect size.

The present investigation used the percentage of all non-overlapping data (PAND) to determine the amount of data non-overlap between baseline and post-training phases. We chose to use PAND because it is a well-recognized nonparametric technique, specifically designed for use in single-case research (Parker, Hagan-Burke, & Vannest, 2007). It also corrects for many of the limitations of other non-overlap techniques (e.g., PND; Parker et al., 2007). We computed PAND using the hand calculation method recommended by Parker, Vannest, and Davis (2011). This involved (a) determining the
smallest number of data points that would need to be transferred across phases to ensure complete data separation (i.e., no overlap), (b) dividing the remaining non-overlapping data points by the total number of data points, and (c) multiplying by 100. We subsequently converted PAND into Pearson’s \( \Phi \), a familiar indicator of effect size ranging from 0 to 1 (Parker, Vannest, & Davis, 2011). \( \Phi \) was calculated using the balanced 2 x 2 contingency table method described by Parker and colleagues (2007). A Microsoft Excel data spreadsheet was developed to facilitate PAND and \( \Phi \) calculations.

Of note, two PAND/\( \Phi \) scores were derived for each staff outcome measure: one comparing baseline to Post-training 1 and a second comparing baseline to Post-training 2. In contrast, only one PAND/\( \Phi \) score was obtained for each student outcome measure due to a limited number of data points in Post-training 2. Therefore, PAND/\( \Phi \) scores on student outcomes measures compare baseline data to all post-training data (i.e., data from Post-training 1 and Post-training 2 combined).

Although it is possible to generate effect sizes from PAND, it is important to be cautious in interpreting these results. Effect sizes in single-case research are known to be larger than those obtained from group designs, and it is therefore not appropriate to interpret effect sizes from single-case and group designs in the same way (Schneider, Goldstein, & Parker, 2008). Although guidelines for interpreting single-case effect sizes remain under development, Schneider and colleagues (2008) found that the median effect size in a sample of 200 published time-series data sets fell between 0.63 and 0.72, depending on the statistical index. Given the tendency for single-case research to produce inflated effect sizes, we chose to base our interpretations of PAND and \( \Phi \) on conservative guidelines used by Burns, Codding, Boice, and Lukito (2010). In particular,
PAND scores $\geq 80\%$ were considered indicative of an effective intervention, whereas PAND scores $\leq 79\%$ were considered questionable in their efficacy. $Phi$ coefficients $\leq 0.29$ were considered negligible, $Phi$ coefficients between 0.30 and 0.49 were considered small, $Phi$ coefficients between 0.50 and 0.69 were considered moderate, and $Phi$ coefficients $\geq 0.70$ were considered strong.
Chapter 3: Results

Results from the current study are presented according to each of the dependent measures, with observational data preceding staff-report data. Time-series graphs are used to display scores from individual observation sessions\(^3\) and bar graphs are used to display overall means from each of the study phases.

3.1 Staff Classroom Management Strategies

**Reactive strategies.** The frequency with which staff members used reactive classroom management strategies is depicted in Figures 1 and 2. Figure 1 illustrates the session-by-session frequency of reactive strategies for individual staff members throughout the duration of the study. Figure 2 presents the mean frequency of reactive strategies for individual staff members within each of the three study phases.

**Baseline.** As is evident from these figures, both staff members displayed a high frequency of reactive strategies in baseline with considerable intra-individual variability. Staff 1 engaged in a mean of 21.8 reactive strategies per session, and Staff 2 engaged in a mean of 22.9 reactive strategies per session.

**Post-training 1.** At the start of Post-training 1, both staff members continued to demonstrate variability in their use of reactive strategies with Staff 2 exhibiting greater fluctuations than Staff 1. As this phase progressed, staff members’ use of reactive strategies stabilized at lower levels; however, it took longer for Staff 2 to achieve consistency. Compared to baseline, both staff demonstrated a reduction in their mean use of reactive strategies, with Staff 1 engaging in 6.8 per session, and Staff 2 engaging in 10.9 per session.

\(^3\) For all time-series graphs, the x-axis represents individual session scores rather than specific dates. Therefore participant scores falling at the same point on the x-axis may occur on different dates.
**Post-training 2.** Both staff members continued to demonstrate a consistently low frequency of reactive strategies at the start of Post-training 2. Towards the end of this phase, however, Staff 1 showed a slight elevation in her use of these strategies. Nevertheless, this phase represented the lowest mean use of reactive strategies for both staff members. Staff 1 engaged in a mean of 4.2 reactive strategies per session, a mean decrease of 17.6 from baseline. Staff 2 engaged in a mean of 2.8 reactive strategies per session, a mean decrease of 20.1 from baseline.

**Summary.** Visual analyses indicate an overall downward trend in the frequency and variability of staff members’ use of reactive strategies over time. Statistical analyses suggest a moderate effect from baseline to Post-training 1 (PAND = 83% and Phi = 0.63) and a strong effect from baseline to Post-training 2 (PAND = 97% and Phi = 0.94).
**Figure 1.** Session-by-session frequency of reactive strategies for individual staff members.

**Figure 2.** Mean frequency of reactive strategies for individual staff members in each study phase.
Proactive strategies. The frequency with which staff members used proactive classroom management strategies is depicted in Figures 3 and 4. Figure 3 illustrates the session-by-session frequency of proactive strategies for individual staff members throughout the duration of the study. Figure 4 presents the mean frequency of proactive strategies for individual staff members within each of the three study phases.

Baseline. As is evident from these figures, both staff members displayed low usage of proactive strategies in this phase with variability across staff members. Staff 1 engaged in a mean of 5.0 proactive strategies per session, and Staff 2 engaged in nearly double that, with a mean of 9.9 proactive strategies per session.

Post-training 1. Throughout this phase, both staff members showed a significant degree of intra-participant variability in their use of proactive strategies. Despite these fluctuations, both staff members’ mean use of proactive strategies increased above baseline levels, with Staff 1 engaging in 16.6 per session, and Staff 2 engaging in 18.5 per session.

Post-training 2. In Post-training 2, both staff members showed declines in the variability and frequency of their use of proactive strategies. Staff 1 engaged in a mean of 11.1 proactive strategies per session, a mean increase of 6.1 from baseline. Staff 2 engaged in a mean of 9.6 proactive strategies per session, a nearly negligible mean decline of 0.3 from baseline.

Summary. Visual analyses indicate an overall trend in which staff members increased their use of proactive strategies following training, but reduced their use of these strategies in Post-training 2. Despite this reduction, statistical analyses suggest moderate effects from baseline to Post-training 1 (PAND = 83% and Phi = 0.63) as well
as from baseline to Post-training 2 (PAND = 84% and Phi = 0.69). Given that both staff members displayed a higher mean level of proactive strategies in Post-training 1 than in Post-training 2, it may initially appear surprising that PAND and Phi are comparable in size for both post-training phases. However, PAND and Pearson’s Phi (when derived from PAND, as is the case in the present study) provide an indication of overlap in time-series scores across phases rather a measure of differences in mean levels. In the present study, the percentage of overlap across baseline and Post-training 1 was similar to the percentage of overlap across baseline and Post-training 2, resulting in comparable statistical findings.
Figure 3. Session-by-session frequency of proactive strategies for individual staff members.

Figure 4. Mean frequency of proactive strategies for individual staff members in each study phase.
3.2 Student Behaviour

Student behaviour was assessed across all three study phases and was analyzed in five different categories: problem behaviour, prosocial behaviour, compliance, acquiescence, and on-task behaviour. Data for each student outcome measure are presented below.

Problem behaviour. The frequency with which students engaged in problem behaviour is depicted in Figures 5 and 6. Figure 5 illustrates the session-by-session frequency of problem behaviours for individual students throughout the duration of the study. Figure 6 presents the mean frequency of problem behaviours for individual students within each of the three study phases.

Baseline. As is evident from these figures, all six students demonstrated extremely high mean levels of problem behaviour in baseline, with an overall mean frequency of 76.2 per session (range = 63.5–89.8). Figure 5 highlights the variability within and across participants. Two students (Child 2 and Child 3) demonstrated some extremely high peaks of problem behaviour. Time-series data also reveal a downward trend in problem behaviour for four students (Child 1, 2, 3, and 5) toward the end of baseline.

Post-training 1. In Post-training 1, all six students demonstrated reductions in their mean level of problem behaviours. Peaks of problem behaviour were also less pronounced in this phase. The overall group mean frequency of problem behaviours dropped to 42.8 behaviours per session (range = 16.9–53.6).

Post-training 2. In Post-training 2, five of six students (Child 1, 2, 3, 4, and 5) demonstrated further reductions in their mean level of problem behaviours. The one
student who did not demonstrate further reductions (Child 6), nevertheless showed levels of problem behaviour that were below baseline. Thus, in this final phase of observation, all six students displayed levels of problem behaviour that were substantially below baseline, with an overall mean of 27.8 problem behaviours per session (range = 14.0–44.7). This represents a sizable mean decrease of 48.4 behaviours from baseline levels.

Summary. Students demonstrated high levels of problem behaviour in baseline, with reductions in the mean frequency and variability of their problem behaviour in the two post-training phases. Despite a high level of intra-participant variability, statistical analyses nevertheless suggest a moderate effect from baseline to post-training (PAND = 79% and Phi = 0.57).
Figure 5. Session-by-session frequency of problem behaviour for individual students.
Figure 6. Mean frequency of problem behaviours for individual students in each study phase.
Prosocial behaviour. The frequency with which students engaged in prosocial behaviour is depicted in Figures 7 and 8. Figure 7 illustrates the session-by-session frequency of prosocial behaviours for individual students throughout the duration of the study. Figure 8 presents the mean frequency of prosocial behaviours for individual students within each of the three study phases.

Baseline. As is evident from these figures, all six students demonstrated low mean baseline levels of prosocial behaviour, with an overall mean frequency of 2.8 prosocial behaviours per session (range = 0.6–5.7). While four students (Child 3, 4, 5, and 6) showed consistently low prosocial behaviours in baseline, two students (Child 1 and 2) demonstrated a slightly different profile. Child 1 and Child 2 displayed higher levels of prosocial behaviours than their peers at the start of baseline; however, these effects were short-lived and decreased later in the phase.

Post-training 1. Post-training 1 revealed inconsistent trends in prosocial behaviours across students. Four students (Child 3, 4, 5, and 6) showed increases in their mean scores from baseline, another student (Child 1) demonstrated no change, and the final student (Child 2) showed a reduction from baseline levels. Three children (Child 1, 3, and 4) demonstrated an increase in the variability of their prosocial behaviour following teacher training. The overall group mean frequency of prosocial behaviours in Post-training 1 was 3.3 per session (range = 1.4–5.7).

Post-training 2. Of the four students who showed increases in prosocial behaviour during Post-training 1, only Child 5 was able to maintain these gains. In fact, Child 5 demonstrated further increases in his mean frequency of prosocial behaviours in Post-training 2 and was the only student to display a level of prosocial behaviour that was
substantially above baseline. Despite these improvements, the frequency of Child 5’s prosocial behaviours remained low. Thus, levels of prosocial behaviour were low for all six students in Post-training 2, with an overall mean of 3.2 prosocial behaviours per session (range = 0–5.0). This represents a nearly negligible mean increase of 0.4 behaviours from baseline levels.

**Summary.** Visual analyses indicate no clear change in the frequency of students’ prosocial behaviours over the course of the present study. These findings are corroborated by statistical analyses, which suggest a negligible effect from baseline to post-training (PAND = 63% and Phi = 0.24).
Figure 7. Session-by-session frequency of prosocial behaviours for individual students.
Figure 8. Mean frequency of prosocial behaviours for individual students in each study phase.
Compliance. The percentage of compliance for each student is depicted in Figures 9 and 10. Figure 9 illustrates the session-by-session percentage of compliance for individual students throughout the duration of the study. Figure 10 presents the mean percentage of compliance for individual students within each of the three study phases.

Baseline. As is evident from these figures, student compliance was highly variable both across and within participants. Five students (Child 1, 3, 4, 5, and 6) showed mean levels of compliance that were below 60% and three of these students (Child 1, 3, and 5) showed mean levels of compliance that were below 50%. The overall mean level of student compliance was 51% (range = 39%–72%).

Post-training 1. In Post-training 1, students continued to display significant intra- and inter-individual variability in their rates of compliance. Five students (Child 1, 2, 3, 5, and 6) demonstrated increases in their mean levels of compliance from baseline, with Child 1 and Child 5 showing the most prominent gains. The remaining student (Child 4) showed virtually no change from baseline. The overall mean level of compliance in this phase was 62% (range = 44%–78%).

Post-training 2. Of the five students who showed improvements in Post-training 1, only one student (Child 3) maintained these gains in Post-training 2. In fact, Child 3 was the only student who showed improvements in this final phase; all of the others showed mean declines from Post-training 1. Nevertheless, compared to baseline, four students (Child 1, 2, 3, and 5) demonstrated mean increases in their compliance, and two students (Child 4 and 6) demonstrated mean decreases in their compliance. The overall mean level of compliance in Post-training 2 was 55% (range = 42%–75%), a small mean increase of 4% points over baseline levels.
Summary. Given the high levels of intra- and inter-individual variability, overall trends for compliance were unclear and difficult to discern. Visual analyses suggest that overall mean student compliance increased from baseline to Post-training 1, but subsequently returned to near-baseline levels in Post-training 2. This trend was corroborated at the individual level in the mean scores of four students. Statistical analyses of student compliance suggest small effects from baseline to post-training (PAND = 66% and Phi = 0.32).
Figure 9. Session-by-session percentage of compliance for individual students.
Figure 10. Mean percentage of compliance for individual students in each study phase.
**Acquiescence.** The percentage of acquiescence for each student is depicted in Figures 11 and 12. Figure 11 illustrates the session-by-session percentage of acquiescence for individual students throughout the duration of the study. Figure 12 presents the mean percentage of acquiescence for individual students within each of the three study phases.

**Baseline.** As is evident from these figures, student acquiescence was highly variable both across and within participants. All students showed mean levels of acquiescence that were at or below 60%, and four of these students (Child 1, 3, 4, and 5) showed mean levels of acquiescence that were at or below 40%. The overall mean level of student acquiescence was 41% (range = 26%–60%).

**Post-training 1.** In Post-training 1, students continued to display significant intra- and inter-individual variability in their rates of acquiescence. Five students (Child 1, 3, 4, 5, and 6) demonstrated increases in mean acquiescence from baseline. The remaining student (Child 2) showed a decline in acquiescence from baseline. The overall mean level of acquiescence in this phase was 55% (range = 41%–79%).

**Post-training 2.** Of the five students who showed improvements in their mean levels of acquiescence in Post-training 1, two of these students (Child 1 and Child 6) maintained these gains, one student (Child 5) continued to show improvements, and the other two students (Child 3 and Child 4) showed declines in Post-training 2. These declines were noticeably smaller for Child 3, who continued to demonstrate above-baseline levels of acquiescence. The one student (Child 2) who did not demonstrate improvements in Post-training 1 displayed comparable levels of acquiescence in Post-training 2 and baseline. Thus, a total of four students (Child 1, 3, 5, and 6) demonstrated
higher mean levels of acquiescence in Post-training 2 than in baseline. The overall mean level of acquiescence in Post-training 2 was 56% (range = 16%–100%), a mean increase of 15% points over baseline levels.

Summary. Given the high levels of intra- and inter-individual variability, overall trends for acquiescence were difficult to discern. Nevertheless, visual analyses indicate increases in the overall mean level of acquiescence following staff training in ECM. At the individual level, four of six students showed improvements in their mean level of acquiescence from baseline to Post-training 2. Statistical analyses of student acquiescence suggest small effects from baseline to post-training (PAND = 70% and Phi = 0.40).
Figure 11. Session-by-session percentage of acquiescence for individual students.
Figure 12. Mean percentage of acquiescence for individual students in each study phase.
**On-task behaviour.** The percentage of on-task behaviour for each student is depicted in Figures 13 and 14. Figure 13 illustrates the session-by-session percentage of on-task behaviour for individual students throughout the duration of the study. Figure 14 presents the mean percentage of on-task behaviour for individual students within each of the three study phases.

**Baseline.** As is evident from these figures, all six students displayed low mean levels of on-task behaviour, with an overall mean of 24% (range = 9%–47%).

**Post-training 1.** In Post-training 1, five students (Child 1, 2, 4, 5, and 6) showed increases in their mean levels of on-task behaviour over baseline. The final student (Child 3) showed a decline in on-task behaviour from baseline. The overall mean level of on-task behaviour was 51% (range = 11%–74%).

**Post-training 2.** Of the five students who showed improvements in Post-training 1, three students (Child 1, 2, and 6) continued to show improvements in their mean level of on-task behaviour in Post-training 2. Two students (Child 4 and Child 5) demonstrated a decline in their mean level of on-task behaviour during this phase; however, their mean scores remained well above baseline levels. The one student (Child 3) who did not demonstrate improvements in Post-training 1 displayed comparable levels of on-task behaviour in Post-training 2 and baseline. Thus, the on-task means for five students (Child 1, 2, 4, 5, and 6) were higher in Post-training 2 than in baseline. Moreover, the overall mean level of on-task behaviour in Post-training 2 increased to 63% (range = 27%–83%), a mean increase of 39% points from baseline.

**Summary.** Visual analyses indicate a general trend in which students’ mean levels of on-task behaviour increased following the staff-training program. Statistical analyses
reveal moderate effects from baseline to post-training (PAND = 84% and Phi = 0.68).
Although these results appear promising, they must be interpreted cautiously due to high levels of intra-participant variability as well as a limited number of observation sessions for several students.
Figure 13. Session-by-session percentage of on-task behaviour for individual students.
Figure 14. Mean percentage of on-task behaviour for individual students in each study phase.
3.3 Social Validity

**Classroom management stress scale.** Classroom management stress scores for each staff member are depicted in Figures 15 and 16. Figure 15 illustrates the session-by-session classroom management stress scores for individual staff members throughout the duration of the study. Figure 16 presents the mean classroom management stress score for individual staff members within each of the three study phases.

**Baseline.** As is evident from these figures, both staff members displayed high and highly variable classroom management stress scores in baseline. Staff 1 displayed a slightly higher mean score than Staff 2. In particular, Staff 1’s mean classroom management stress score was 6.2 and Staff 2’s mean classroom management stress score was 5.0.

**Post-training 1.** In Post-training 1, both staff members continued to demonstrate high and highly variable classroom management stress scores. Staff 1 displayed a mean score of 6.2, representing no change from baseline. Staff 2 displayed a mean score of 5.7, representing a minor increase from baseline.

**Post-training 2.** In Post-training 2, both staff members demonstrated a substantial change in their reported stress levels, with a reduction in both the variability and level of their classroom management stress scores. Towards the end of this phase, however, Staff 1 showed a slight peak in her stress levels. Nevertheless, this phase clearly represented the lowest classroom management stress scores for both staff members. Staff 1 displayed a mean classroom management stress score of 1.1, a decrease of 5.1 points from baseline. Staff 2 displayed a mean classroom management stress score of 0.6, a decrease of 4.4 points from baseline.
**Summary.** There was an overall trend in which staff members’ classroom management stress scores were high and highly variable in baseline and Post-training 1; however, in Post-training 2, there was a substantial reduction in both the level and variability of staff classroom management stress scores. Statistical analyses suggest a negligible effect from baseline to Post-training 1 (PAND = 63% and Phi = 0.26) and a strong effect from baseline to Post-training 2 (PAND = 94% and Phi = 0.86).
Figure 15. Session-by-session classroom management stress scores for individual staff members.

Figure 16. Mean classroom management stress score for individual staff members in each study phase.
ITS. Figure 17 depicts the total stress score for the classroom teacher in relation to each of her students before the staff-training program (in baseline) and near the end of data collection (in Post-training 2). ITS scores below the 80th percentile are considered normal, scores between the 80th and 89th percentiles are considered elevated, and scores at or above the 90th percentile are considered clinically significant.

**Baseline.** Before treatment, the classroom teacher reported clinically significant stress levels for two students, elevated stress levels for three students, and normal stress levels for only one student. Her total stress scores for individual students ranged from the 74th to the 98th percentile.

**Post-training 2.** By the end of data collection, the teacher reported clinically significant or extremely elevated stress levels for all six students, with scores for individual students ranging from the 89th to the 99th percentile. This represented an increase in stress levels for all six students.
Figure 17. Classroom teacher's total stress score for each participating student in baseline and Post-training 2.
Staff satisfaction survey. Staff members’ completed a satisfaction survey following the conclusion of data collection. Their responses to the survey revealed an overall mean satisfaction rating of 4.0 out of 5.0, with higher scores suggesting greater satisfaction with the training program. Staff 1 expressed greater satisfaction than Staff 2. In particular, Staff 1 provided a mean rating of 5.0 and Staff 2 providing a mean rating of 3.0.

BASC-2-TRS. The BASC-2-TRS was intended to provide an indication of whether the magnitude of change in student behaviour was large enough to be noticed by the classroom teacher. However, the results from this measure are considered invalid as the teacher displayed elevated scores on the BASC-2-TRS F Index, a validity scale designed to detect a respondent’s tendency to provide excessively negative ratings. Data from this measure must therefore be interpreted with extreme caution, and as such, BASC-2-TRS results are not presented within the Results section, but rather, can be found in Appendix E.
Chapter 4: Discussion

The present investigation was designed to assess the efficacy of an ECM staff-training program in a self-contained classroom for students with severe externalizing behaviour problems. Two staff members and six students participated in this study. Using a combination of observational and staff-report data, we evaluated the effects of the intervention on three target areas: 1) staff classroom management strategies, 2) student behaviour, and 3) the social validity of the ECM training program. Results indicated that staff members reduced their use of reactive strategies following ECM training, but were inconsistent in their use of proactive strategies. Data also showed that students engaged in fewer problem behaviours following training, but improvements on other student outcome measures were less clear. Moreover, although social validity measures indicated some satisfaction with the staff training effort as well as reductions in staff stress levels related to classroom management, ECM training did not reduce stress associated with teacher-student relationships.

4.1 Staff Classroom Management Strategies

We hypothesized that participation in the ECM training program would lead to a reduction in staff members’ use of reactive classroom management strategies and an increase in their use of proactive classroom management strategies. Although this trend was apparent in Post-training 1, it differed somewhat in Post-training 2. Specifically, staff members effectively reduced their use of reactive approaches following training, demonstrating a decreased frequency of these procedures in Post-training 1, with further reductions in Post-training 2. In contrast, staff members were inconsistent in their application of proactive approaches across the two post-training phases. Although they
demonstrated an increase in the frequency of proactive approaches in Post-training 1, their use of these strategies decreased in Post-training 2.

One explanation for this finding involves the varying levels of support provided within these phases. In Post-training 1, staff members were provided with significant in-classroom support from the author in the form of priming, modelling, praise, and feedback. However, in Post-training 2, staff members received only minimal support that was typically offered only upon request. When provided with a high level of support, staff were successful in applying the proactive strategies, but when this support was reduced, their use of proactive approaches declined. This trend suggests that the application of proactive classroom management strategies in an extremely disruptive behavioural classroom may require a high level of in-vivo support.

Although other errorless remediation programs have been successfully implemented by classroom staff with less direct involvement from the investigators (e.g., Ducharme et al., 2010; Ducharme et al., 2008; Ducharme & Harris, 2005), these studies each focussed on only one keystone skill. In contrast, the content of staff training in the present study included strategies related to four keystone areas: compliance, acquiescence, on-task behaviour, and communication. This added complexity may have made it difficult for staff members to learn, recall, and/or execute the relevant proactive strategies without the extra on-site prompting and support provided in Post-training 1.

Another possibility is that the author’s involvement may have influenced staff members’ emotional resources and feelings of self-efficacy (i.e., the confidence in one’s ability to successfully perform a required behaviour, which predicts the intensity and persistence with which an individual approaches a task; Bandura, 1977a). Within this
particular classroom, there was an extreme lack of resources and support, which may have resulted in the classroom staff feeling undervalued, unsupported, and emotionally drained prior to participating in the ECM program. It is possible that the author’s intensive involvement in Post-training 1 may have resulted in a renewed sense of relief and support, providing classroom staff with the emotional resources and self-confidence required to focus on implementing proactive procedures. However, when the intensive support was withdrawn in Post-training 2, staff members may have reverted to feelings of emotional exhaustion and uncertainty about their abilities, a state that may have hindered their application of proactive strategies. This potential explanation falls in line with research by Woolfolk Hoy and Burke-Spero (2005) who found that the sense of self-efficacy of new teachers increased when they were provided with professional development support, but fell when this support was withdrawn.

Interestingly, in an unprompted update provided recently by the classroom teacher in the present study, she passionately described the success that she was having implementing ECM strategies in her current classroom with two assistants. The teacher also noted that she was encouraging other staff members at her school to use ECM methods. Thus, when the teacher had inadequate classroom supports during the conduction of the study, she was unable to maintain her use of proactive strategies. However, it appeared from this anecdotal evidence that, under her current conditions, which appeared to involve higher levels of classroom support, the teacher was more enthusiastic about her ability to make use of the training provided to successfully introduce positive changes into her classroom management repertoire.
A final explanation for staff members’ discrepant use of proactive strategies across post-training phases relates to the concept of outcome expectancy, an individual’s beliefs about whether a particular behaviour will result in certain outcomes (Bandura, 1977a). In conjunction with self-efficacy, outcome expectancies are thought to predict an individual’s likelihood and intensity of adherence to a particular behavioural repertoire (Bandura, 1977a, 1986, 1997; Martin, Haskard-Zolnierek, & DiMatteo, 2010; Riekert & Drotar, 2000). In the present study, the extent of reductions in problem behaviour from baseline to Post-training 1 may not have met staff expectations, resulting in less motivation for engaging in the newly learned proactive procedures in Post-training 2, especially when the primary stimulus for change (i.e., the author) was no longer intensively involved. Although problem behaviour improved substantially from baseline levels, the remaining aberrant responses were still highly challenging to manage, potentially making staff members feel that their intervention efforts were ineffective. Thus, they may have abandoned their use of proactive strategies during Post-training 2, as the observed behavioural improvements in Post-training 1 failed to meet their expectations for change.

4.2 Student Behaviours

Student behaviour was assessed across five outcomes measures: problem behaviour, prosocial behaviour, compliance, acquiescence, and on-task behaviour. Although there were substantial reductions in student problem behaviour for all six students, changes in the other variables were more ambiguous due to significant inter and intra-participant variability. Group mean scores for student prosocial behaviour, compliance, and acquiescence, suggest overall improvements following ECM training;
however, visual and statistical analyses suggest that these improvements are questionable due to the considerable overlap in scores across study phases. The group mean score for student on-task behaviour was also found to increase after training. Note, however, that although these gains translated into a moderate effect size for on-task behaviour (and the largest improvement among the prosocial outcome measures), these results must be interpreted with caution given the high levels of variability across participants and the limited number of observation sessions for several students.

The most likely explanation for the differential rates of change across student outcome variables relates to the consistency with which teaching staff applied the various classroom management procedures. As previously mentioned, staff members effectively reduced their use of reactive procedures following ECM training; however, they struggled to consistently apply proactive strategies. Given that antisocial behaviours are more likely to develop in the context of punitive, harsh, and inconsistent discipline practices (Farrington, 2005; Mayer, 2001), it is likely that reductions in the frequency and variability of reactive approaches led to concomitant decreases in student problem behaviours. Thus, in baseline, staff members frequently responded to students’ problem behaviour with reactive and coercive forms of discipline, thereby modeling and endorsing the use of power-assertive strategies in the classroom (Bandura, 1977b). These reactive techniques were typically met with further student misbehaviour, with both parties increasing the severity of their responses until one side eventually capitulated. This coercive interaction style likely promoted the development and maintenance of problem behaviour in baseline, as student antisocial behaviour was reinforced each time it allowed
students to successfully control a situation (Patterson, 1982; Reid & Patterson, 1989; Reinke & Herman, 2002).

In contrast, following ECM training, staff members reduced their usage of reactive classroom management techniques. This reduction in reactive strategies may have led to fewer and less intense confrontations between staff and students, thereby minimizing opportunities for behavioural escalations and reducing the overall level of student problem behaviour. Thus, ECM training may have decreased the coercion and conflict in staff-student interactions.

Unfortunately, given the modest downward baseline trend in problem behaviour for several students, we cannot incontrovertibly attribute decreases in problem behaviour to the intervention. It is possible that improvements in student problem behaviour began before ECM training and were related to factors extraneous to the intervention, such as maturation (Gliner, Morgan, & Leech 2009).

In the present study, student problem behaviours may have naturally decreased throughout the semester as a result of natural learning and development, with the gains occurring independent of the intervention. However, this is unlikely considering that severe and extensive externalizing behaviour in childhood typically persists over time and does not spontaneously resolve without intervention (Frick, 1998; Moffitt et al., 2008). Further, baseline observations were initiated in the fifth month of the school year and students had already been provided with substantial time to adjust to their classroom environment. Although it is necessary to consider the potential influence of these extraneous factors, the downward baseline trends in problem behaviour with some students is more likely attributable to naturally-occurring daily fluctuations in behaviour.
As such, improvements in students’ aberrant responses may be best accounted for by ECM training and the subsequent reduction in reactive classroom management.

Although reductions in staff members’ use of power-assertive strategies may have resulted in a decrease in student problem behaviours, this was not sufficient to engender widespread improvements in prosocial interactions. In fact, researchers have noted that the promotion of prosocial child responses requires consistent and frequent application of proactive and success-focussed remedial strategies by mediators (Ducharme, 2003; Ducharme & Shecter, 2011; McGinnis, Frederick, & Edwards, 1995). Moreover, consistency is often considered to be a key component of successful classroom management and the maintenance of an orderly classroom environment (Freidberg, 1983). When teachers are consistent in their use of proactive procedures, they establish a structured and predictable environment in which students can succeed and excel (Freidberg, Huzinec, & Templeton, 2009); however, when these strategies are applied inconsistently, child behavioural successes are less likely (Freidberg, 1983). Thus, the inconsistent use of proactive procedures by teaching staff in the present study may account for the inconsistent improvements in student behaviour.

Of all the prosocial outcome measures, students demonstrated the greatest improvements in their on-task skills. This finding may be the by-product of reduced problem behaviours, as fewer disruptions and distractions in the classroom may have allowed students to remain better focussed on their work (Ducharme & Harris, 2005). That is, students were able to spend more time actively engaged in learning when they were exposed to a calmer and less chaotic classroom environment with fewer distractions from other students (Gettinger, 1986).
Although reducing the overall level of classroom disruption may have allowed for improvements in student on-task behaviour, it was not sufficient to produce substantial changes in other student outcomes (e.g., prosocial behaviour, compliance, acquiescence). This may be because distractions in the classroom may have a stronger impact on students’ ability to remain focused and on-task than on compliance with teacher requests, acquiescence with peer demands, or spontaneous prosocial acts. For example, if one student begins to engage in fewer instances of externalizing behaviour during academic work periods, this would likely render it easier for other students to focus on their work, as distracting environmental stimuli can directly affect on-task behaviour (Gettinger, 1986; Prinz, Tarnowski, & Nay, 1984). However, a simple reduction in classroom distractions would likely be insufficient to improve prosocial student behaviours that are less directly related to distractibility (e.g., compliance, acquiescence, and spontaneous prosocial acts).

4.3 Social Validity

Social validity was assessed through measures of staff satisfaction with the training program and staff stress levels. Results from the staff satisfaction questionnaire suggested that Staff 1 was much more satisfied with the intervention than Staff 2. Staff 1 was pleased with the content and format of the training program as well as the support provided by the investigators. Staff 2 also appreciated the investigators’ support, but did not feel that her classroom management needs were met by ECM training. This discrepancy in satisfaction ratings may be related to the differential impact of the intervention on each staff members’ use of proactive classroom management strategies. Whereas Staff 1 increased her mean use of proactive strategies by more than double from
baseline to Post-training 2, Staff 2 demonstrated minimal gains from baseline to Post-training 2. Thus, Staff 2 appeared to benefit less from the training, potentially reducing her satisfaction with the program.

It is also possible that staff members’ differential satisfaction ratings can be accounted for by their prior knowledge of proactive classroom management strategies. Informal conversations with Staff 2 revealed that she regularly enrolled in professional development courses (some focussing on behaviour management) and possessed a certain understanding of and interest in proactive classroom management prior to training. Thus, Staff 2 may have expressed less satisfaction with ECM training because she was already familiar with some of the concepts beforehand and therefore considered the information presented to be less essential.

With respect to classroom management stress, staff members demonstrated a reduction in classroom management stress scores following ECM. However, this change did not occur until Post-training 2, an unanticipated finding considering that there were earlier decreases in reactive procedures and student problem behaviour, two known predictors of teaching stress (Clunies-Ross et al., 2008; Geving, 2007). This unexpected finding may be related to the notion of effort-reward imbalance (Siegrist, 1996). According to this view, a perceived imbalance between effort and reward can be very stressful for an individual. In the present study, staff members devoted significant time to the management of student behaviour in Post-training 1, leading to a reduction in problem behaviour. Unfortunately, this improvement appeared not to be clinically significant, with problem behaviours still occurring regularly, albeit at a substantially reduced level. This incomplete reduction in problem behaviour was likely inadequate for
resolving the strain on staff emotional and physical resources. Thus, classroom staff may have experienced an imbalance between their efforts (i.e., time actively engaged in classroom management) and rewards (i.e., perceived level of problem behaviour) in the first phase of intervention. In contrast, staff members’ overall usage of behaviour management strategies dropped in Post-training 2. By putting less time into active classroom management, classroom staff may have reduced the imbalance between effort and reward, leading to a reduction in overall stress levels (and classroom management stress scores) in this final phase.

Our examination of social validity also revealed that ECM training did not reduce stress levels within the teacher-student relationship. In fact, teacher stress scores on the ITS actually increased from baseline to Post-training 2 for all six students, despite the observed decline in coercive exchanges between staff and students. As discussed earlier, there may have been a discrepancy between the classroom teacher’s expectations for student improvement and the actual behaviour change that occurred. When such a discrepancy occurs and outcome expectancies are not met, an individual may experience stress, emotional exhaustion, and negative emotions, such as disappointment and dissatisfaction (Fisher, 1985; Proost, van Ruysseveldt, & van Dijke, 2012; Wanous, 1976; Zeelenberg, van Dijk, Manstead, & van der Pligt, 2000). Thus, in the present study, given the behavioural challenges still remaining in the classroom, the classroom teacher’s outcome expectancies may have been disconfirmed, leading her to experience feelings of resentment and frustration towards her students and their still troublesome behavioural repertoires.
Finally, it is noted that despite marked reductions in student problem behaviour following ECM training, these improvements may not have been clinically meaningful for staff or students. Students continued to engage in numerous disruptive and antisocial acts following ECM training, displaying a level of conduct problems that was well above what is typical. This reduction in problem behaviour may not have been large enough to provide classroom staff with meaningful emotional reprieve. Moreover, students’ level of challenging behaviour may have remained too high for them to be successfully integrated into a mainstream classroom in the following year. Therefore, the observed improvements in students’ problem behaviour appeared to lack clinical significance.

4.4 Limitations and Future Directions

Although the current investigation offers important information about the practicality and effectiveness of training staff in ECM, certain limitations were apparent. This first concern relates to the study’s interrupted time-series design. Although this quasi-experimental design controls for many threats to internal validity (Posavac & Carey, 1997), greater experimental control would have been achieved through the use of a multiple baseline design (i.e., a time-series design in which the start of treatment is staggered across participants or groups; Barlow & Hersen, 1984). Multiple baseline approaches permit the replication of treatment effects at different points in time, making it possible to determine whether behavioural improvements consistently coincide with the initiation of an intervention or whether treatment gains may be due to broader contextual influences.

In the present study, this type of design would have been helpful for interpreting the occasional occurrence of a downward trend in problem behaviour for some students.
towards the end of baseline. Unfortunately, given that ECM was being conducted as a class-wide approach, it was not possible to time-lag the start of treatment within the single classroom in the present study. It was also not feasible to find another classroom with comparable levels of problem behaviour and staff support to partake in a multiple baseline across groups design. As such, treatment effects were replicated across participants but not across time. Future research should attempt to improve internal validity by staggering the implementation of ECM training across multiple behavioural classrooms.

The second limitation relates to the maintenance of treatment effects over time, an important component of external validity (Hartmann & George, 1999). While time-series observations allowed us to monitor staff and student behaviour over the course of five months, we were unable to conduct follow-up observations in the subsequent academic year due to changes in classroom staffing and student placements. Thus, while we can conclude that certain treatment gains (e.g., reductions in reactive classroom management and student problem behaviour) were maintained over the course of the study, we are unable to comment on the long-term durability of these effects. Future studies investigating the effectiveness of ECM would benefit from the addition of follow-up observations.

A third area of concern involves the selection of the staff and classroom that served as the participants and location for the present study. We were provided with permission to engage with only a limited number of teachers at the participating school, in particular, those in classrooms that were most desperately in need of emotional and personnel support. Staff members in the present classroom appeared to feel stressed,
exhausted, and frustrated by the lack of administrative support and by the assemblage of so many children with clinically severe levels of behavioural difficulties in a single classroom. Under such circumstances, the potential for producing clinically significant gains was seriously limited. Treatment effects in the present study would likely have been more substantial if ECM had been introduced into a classroom in which staff members felt a greater sense of institutional support and the staffing assignments matched the severity of clinical issues present. Thus, future research should be conducted under circumstances that ensure that the effectiveness of the ECM approach is not compromised by a significant lack of classroom resources.

A fourth challenge stems from the timing of the staff training in the present study. Due to delays in obtaining consent, baseline observations did not commence until January. By the time a sufficient number of baseline data points were collected, it was already well into the academic year, and as a result, staff training was not initiated until March. This meant that staff and students had engaged in negative interactions for six months prior to the intervention, creating well-established patterns of problem behaviour that were difficult to change and reducing the amount of time available for proactive intervention. These delays in initiating training likely hindered some of the potential effects of the program. Future research should involve the implementation of the ECM intervention much earlier in the academic year.

A fifth concern relates to the skill level of the teaching staff following our training efforts. Given the previously noted delays in initiating training combined with staff members’ high levels of stress and exhaustion, we were unable to employ an observable behavioural criterion to ensure that staff members could effectively apply ECM
procedures. As a result, it was unclear whether staff members possessed the skills necessary to bring about clinically significant behaviour change. Staff members would likely have been more consistent in their application of these proactive strategies if they had been required to demonstrate mastery of ECM procedures at the end of the training program. This limitation should be remedied in future research by ensuring that staff members are trained to a pre-specified criterion skill level. Moreover, systematic fading of the investigators’ supports should occur after staff members have demonstrated skill mastery and experienced a high level of success. This may help foster a sense of self-efficacy in staff members, which may in turn lead to better adherence to proactive strategies following complete withdrawal of support.

A sixth limitation stems from the absence of qualitative measures in the present investigation. Although staff members were able to provide feedback about the intervention through a satisfaction questionnaire, it may have also been helpful to interview staff members about different aspects of their experience throughout the course of our involvement. This type of information might have helped to provide an explanation for some of the unexpected findings (e.g., staff members’ inconsistent use of proactive strategies and their decline in classroom management stress during Post-training 2). Future research investigating the effectiveness of ECM training would benefit from incorporating such qualitative measures.

A final challenge concerns the complexity of the ECM program. As previously mentioned, other errorless remediation studies have produced promising effects when the emphasis was placed on a single keystone skill (e.g., Ducharme et al., 2010; Ducharme et al., 2008; Ducharme & Harris, 2005). However, the classroom management curriculum
in the present study, which focussed on four keystones simultaneously, may have been
too complex for staff members to successfully master in a short period of time. It is
possible that training teachers in the use of one keystone skill at a time might produce
more substantial effects on teacher behaviour. Such an approach could feasibly be
evaluated by means of a study in which teachers were taught to implement the skills for
each keystone in a sequential manner, with measurement of effects on teacher and child
behaviour throughout the entire process. This research approach would require much
more time than we had available in the present study but would provide initial evidence
of the importance of each of the four keystone components, helping to determine whether
all four keystone areas contribute substantially to treatment effects.

Notwithstanding these limitations, the present study makes a contribution to the
literature on proactive classroom management and staff training programs. Findings
from the current research suggest that it is possible to effect change in the clinically
severe problem behaviours of students through a brief staff training program focused on
proactive classroom management. This study provides support for the current
educational movement towards more positive forms of classroom management, and
suggests that teachers may benefit from in-service training in proactive classroom
management. Moreover, teacher education programs would benefit by placing much
greater emphasis on the development of effective classroom management skills in pre-
service teachers, especially those who plan to work in special education settings.

The present study also provides initial evidence to support ECM training as a
socially acceptable form of school-based intervention for staff and students in a self-
contained behavioural classroom. However, given the trend toward more inclusive
special education practices in Ontario, it will be important to evaluate whether the ECM model can be effectively introduced into mainstream classrooms as a support for students with challenging behaviour. Ducharme and colleagues are currently exploring this approach.

Finally, while improvements in the present study were not observed across all domains, important reductions did occur in staff reactive procedures and student problem behaviour. These improvements may not have been clinically significant, but they are nevertheless noteworthy given that the supports provided to the classroom teacher did not match the severity of student problem behaviour. Had additional resources and personnel support been available, treatment effects in the present study would likely have been more substantial.
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Appendix A
Sample Coding Sheet: Staff Classroom Management Techniques

<table>
<thead>
<tr>
<th>TIME</th>
<th>REINFORCEMENT</th>
<th>MODERATING STRATEGIES</th>
<th>REACTIVE RESPONSES</th>
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</thead>
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<td></td>
<td>Praise</td>
<td>Reward</td>
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<tr>
<td>TOTAL</td>
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</tbody>
</table>

PROACTIVE STRATEGIES: _______ REACTIVE STRATEGIES: _______
# Appendix B

## Sample Coding Sheet: Student Behaviours

**ID of student being observed:** ____________________  
**IOR:** □  
**Date (MM/DD/YY):** ____________________  
**Phase (circle):** Baseline / PT1/PT2  
**Total length of observation (in minutes):** ____________  
**Coder’s Name:** ________________

<table>
<thead>
<tr>
<th>Time</th>
<th>Compliance</th>
<th>Acquiescence</th>
<th>Problem Behaviours</th>
<th>Prosocial Behaviour</th>
<th>Notes / Request</th>
</tr>
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<td>+V + P</td>
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</tr>
<tr>
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<td>+V + P</td>
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<td>+V + P</td>
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</tbody>
</table>

**TOTAL:**

Compliance to individual requests: $\frac{Ci}{(Ci + NCi)} \times 100 = \underline{______}\%$

Compliance to group requests: $\frac{Cg}{(Cg + NCg)} \times 100 = \underline{______}\%$

Total compliance: $\frac{(Ci + Cg)}{(Ci + Cg + NCi + NCg)} \times 100 = \underline{______}\%$

Total acquiescence: $\frac{A}{(A + NA)} \times 100 = \underline{______}\%$
Appendix C

Sample Coding Sheet: Student On-Task Behaviour

<table>
<thead>
<tr>
<th>TIME</th>
<th>INTERVAL</th>
<th>FOCUS</th>
<th>NEGATIVE BEHAVIOURS</th>
<th>NOTES</th>
</tr>
</thead>
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<td>ON</td>
<td>OFF</td>
<td>N</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>ON</td>
<td>OFF</td>
<td>N</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>ON</td>
<td>OFF</td>
<td>N</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>ON</td>
<td>OFF</td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>ON</td>
<td>OFF</td>
<td>N</td>
</tr>
<tr>
<td>1 min</td>
<td>6</td>
<td>ON</td>
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<td>N</td>
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<tr>
<td>7</td>
<td></td>
<td>ON</td>
<td>OFF</td>
<td>N</td>
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<td>8</td>
<td></td>
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TOTAL: ON-TASK ___% OFF-TASK ___% NEUTRAL ___% AGGRESSIVE/DISRUPTIVE ___%
Appendix D

Transcribed Content from Staff Training Handout

THE FOUR KEystONES AND STRATEGIES FOR IMPLEMENTATION

1. COMPLIANCE

Use proper request delivery
  • Get student’s attention
  • Explain task requirements before you make a request
  • Use polite but firm tone
  • Issue requests as commands
  • Use short and simple requests
  • Make only one request at a time
  • Provide time for the student to respond (10 seconds)
  • Do not do the task for the student but provide assistance if necessary
  • After the request, do not engage in discussion about the task with the student

Give easy or enjoyable requests
  • Deliver a high proportion of “easy” requests daily
  • Intersperse easy requests among regular classroom requests that you routinely give

Give priming statements before delivering a difficult request
  • Provide a detailed statement to explain the upcoming challenge
  • Let the student know you have confidence that they can handle the request/situation

Reinforce compliance immediately
  • Label the behaviour in your praise

Ignore non-compliance and minor negative behaviours
  • Wait about 20 seconds and deliver the request again, this time providing extra supports to increase compliance.

2. SOCIAL SKILLS

Incorporate the word “flex” and “flexing” into your classroom

Help students navigate peer interactions through prompting and support
  • Prompt student to invite a peer to play, to wait a turn, to share, etc.
  • During negative peer interactions, focus your attention on the victim and not the aggressor if you can
Reinforce peer cooperation

• Praise students for cooperating with their peers and praise victims of peer provocation for staying calm

Role-playing

• Choose a ‘skill of the day’ and introduce it to your students at a specified time (e.g., at circle). Demonstrate appropriate uses of the skill and have students practice role-playing appropriate skill use. Skill areas include:
  1. Helping & sharing
  2. Playing by rules, taking turns, letting others win
  3. Listening and going along with someone else’s ideas
  4. Keeping your cool when things aren’t going your way
  5. Approaching and inviting others to join in
  6. Complimenting and thanking others

3. ON-TASK SKILLS

Make partnership & motivational statements to get the student started

Provide prompts that allow the student to experience success

Embed short durations of independent work into longer durations of adult-supported work

  a) Help the student complete the first few questions of their work
  b) Leave the student to work independently for a short duration of time (1 or 2 minutes)
  c) When the independent interval is over, return to the student and provide praise for the effort made, e.g., “Wow! You kept working the whole time I was away! You should be proud of yourself!”
  d) The next day, try to increase the duration of the independent interval by a short amount (30 to 60 seconds)

Reinforce on-task efforts

• Say “You’re doing a great job focussing on your assignment. Keep up the good work!”

Incorporate student interests and preferred activities into materials

4. COMMUNICATION

Anticipate situations in which problem behaviour is likely to occur

• Prompt student to ask for help or a break if they appear overwhelmed or frustrated
Prompt student to raise their hand or use their words to let you know what they want or need
  • Say, “Would you like to raise your hand? I’d be happy to come over and talk to you”

Be aware of and responsive to all the strategies that a student uses to communicate (non-verbal behaviours)

Respond immediately to a student’s attempt to communicate
  • If you can’t help the student immediately, let them know you will be there in a few minutes or ask another staff to respond

Reinforce Communicative Attempts
  • Say, “Good Asking” or “I like how you used your words to express that you were feeling upset.”

Ensure that the student’s request leads to the desired outcome (e.g., attention from you, a break, etc.)
Appendix E

BASC-2-TRS Results

As mentioned within the Results section, teacher ratings on the BASC-2-TRS were considered invalid due to elevated scores on the F Index, a validity scale designed to detect excessively negative response patterns. In particular, the classroom teacher provided excessively negative ratings for three of six students before participating in the ECM training program (in baseline), and she provided excessively negative ratings for all six students at the end of data collection (in Post-training 2). As such, the results presented below must be interpreted with extreme caution.

Please note, on the first four scales of the BASC-2-TRS (Externalizing Problems, Internalizing Problems, School Problems, and Behavioral Symptoms Index), scores below 60 are considered normal, scores between the 60 and 69 are considered at-risk, and scores at or above 70 are considered clinically significant. On the final scale of the BASC-2-TRS (Adaptive Behavior), scores above 40 are considered normal, scores between 31 and 40 are considered at-risk, and scores at or below 30 are considered clinically significant.

Externalizing Problems Scale

**Baseline.** According to the classroom teacher’s ratings, five students displayed clinically significant externalizing behaviour problems in baseline, with one student displaying at-risk externalizing behaviour. The baseline group mean score on the Externalizing Problems scale was 81.0 (range = 69–92), indicating highly elevated levels of externalizing behaviour problems.
**Post-training 2.** In Post-training 2, the teacher’s ratings suggested an increase in externalizing problems for all six students. The Post-training 2 group mean score was 97.5 (range = 96–99), with all students displaying clinically significant levels of externalizing behaviour. Thus, the teacher perceived an overall increase in students’ externalizing behaviour from baseline to Post-training 2.

**Internalizing Problems Scale**

**Baseline.** According to the classroom teacher’s ratings, three students displayed clinically significant internalizing problems in baseline, two students displayed at-risk levels of internalizing problems, and one student displayed normal levels of internalizing problems. The baseline group mean score on the Internalizing Problems scale was 71.0 (range = 56–84), indicating elevated overall levels of internalizing behaviours.

**Post-training 2.** In Post-training 2, the group mean score increased to 75.3 (range = 60–87), with five students displaying clinically significant levels of internalizing problems and one student displaying at-risk levels of internalizing problems. Thus, the teacher perceived an overall increase in students’ internalizing problems from baseline to Post-training 2.

**School Problems Scale**

**Baseline.** According to the classroom teacher’s ratings, two students displayed clinically significant school problems in baseline, three students displayed at-risk levels of school problems, and one student displayed normal levels of school problems. The baseline group mean score on the School Problems scale was 65.5 (range = 59–71), indicating at-risk overall levels of school problems related to attention and learning.
**Post-training 2.** In Post-training 2, the teacher’s ratings suggested an increase in school problems for all six students. The Post-training 2 group mean score increased to 75.0 (range = 73–78), with all six students displaying clinically significant levels of school problems. Thus, the teacher perceived an overall increase in students’ school problems from baseline to Post-training 2.

**Behavioral Symptoms Index Scale**

**Baseline.** According to the classroom teacher’s ratings, all six students displayed clinically significant problems on the Behavioral Symptoms Index, a measure of atypicality and withdrawal. The baseline group mean score on the Behavioral Symptoms Index was 80.7 (range = 73–86), indicating clinically significant problems.

**Post-training 2.** In Post-training 2, the teacher’s ratings suggested an increase in behavioural symptoms for all six students. The group mean score increased to 93.0 (range = 85–105), with all six students displaying clinically significant scores. Thus, the teacher perceived an overall increase in students’ problems related to atypicality and withdrawal from baseline to Post-training 2.

**Adaptive Behavior Scale**

**Baseline.** According to the classroom teacher’s ratings, one student displayed clinically significant levels of adaptive behaviour, four students displayed at-risk levels of adaptive behaviour, and one student displayed normal levels of adaptive behaviour. The baseline group mean score on the Adaptive Behavior Scale was 35.2 (range = 30–41), indicating an at-risk group level of adaptive behaviour.

**Post-training 2.** In Post-training 2, the teacher’s ratings suggested a decrease in adaptive behaviour for all six students. The group mean score decreased to 28.5 (range =
26–32), with four students displaying clinically significant scores and two students displaying at-risk scores. Thus, the teacher perceived an overall decrease in students’ adaptive behaviour from baseline to Post-training 2.