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MANAGING NON-COMPLIANCE IN THE CLASSROOM: A REVIEW OF EMPIRICALLY BASED INTERVENTIONS

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Abstract
Non-compliance in the classroom is a serious and time-consuming problem for teachers. This paper reviews empirical studies over the last 10 years that describe interventions delivered by classroom teachers to manage non-compliance within both regular and special education classrooms. Strategies such as behavioural momentum, effective commands or precision requests, positive reinforcement and group contingencies can be used effectively by teachers at little cost of time or money. Other strategies show potential but need further research before they can be classed as empirically-based. Multi-component interventions, involving combinations of antecedent and consequence based strategies, may hold the greatest potential for classroom use.

Disruptive behaviour in classrooms is a recognised concern of Australian teachers (Beanman, Wheldall, & Kemp, 2007; Vinson, 2002) and can be very difficult to manage (Jenson, Olympia, Farley, & Clark, 2004). In a study of secondary teachers in Victorian schools, Little (2005) found that 68% of teachers reported that they spent more time on "issues of order and control" than they felt they should. Similarly, Stephenson, Linfoot, and Martin (2000) found that 20% of Kindergarten to Year 2 teachers surveyed were not confident in managing student behaviour in their classes.

Teachers generally consider compliance and following rules and directions as important skills for a student to have in order to achieve at school (Lane, Pierson, & Givner, 2003). Ford, Olmi, Edwards, and Tingstrom (2001) noted that non-compliance in response to more than 40% of teacher commands, affected the ability of students to participate in academic activities and progress at a

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satisfactory academic pace.

Non-compliance may be a precursor to other disruptive behaviours in the classroom and to more serious problems like Opposition Defiance Disorder (ODD) and Conduct Disorder (CD) (Walker, Ramsey, & Gresham, 2004). It may also lead to much more serious problem behaviour such as delinquency, vandalism and stealing in some children (Kalb & Loeber, 2003; Walker et al.2004). A student who has refused to do a task is obviously 'off-task', and while off-task is likely to look for other activities that may involve talking to or disrupting other students. If a teacher insists on compliance there is a likelihood that the situation will escalate to anger and hostility. Non-compliance may be regarded as a component of disruptive behaviour in general and indeed, Walker et al. considered that in many instances, non-compliance was at the root of disruptive behaviours. Non-compliance is thus of concern to both general and special educators as it is exhibited by students with special education needs and those at risk.

Non-compliance has been defined as the refusal of a child to initiate or complete a request made by another person (Forehand & McMahon, 1981). This refusal may include direct defiance, simple refusal, passive non-compliance (ignoring the adult's request) or attempting to negotiate an alternative to the requested behaviour (Walker et al., 2004). Walker et al. provide a specific operational definition of non-compliance as "1) no response is forth coming, 2) no response is produced or initiated within a specified time (e.g. 5-10 seconds), or 3) some alternative, nonrequested behaviour is offered instead" . It can also refer to a performance that fails to come up to a set standard when the student is capable of that standard (Morgan & Jenson, 1988 cited in Walker et al., 2004). Non-compliance has been alternatively termed disobedience or defiance (Kalb & Loeber, 2003), resistance (Maag, 2000) and task refusal (Houssart, 2002). For the purpose of this review the operational definition put forward by Walker et al. will be used.

Much of the research on interventions to deal with non-compliance has been carried out with children and their parents (e.g. Forehand & McMahon, 1981). These interventions have centred mainly on parent training courses involving skills such as effective commands or precision requests, use of reinforcement and response cost procedures and setting limits (Kalb & Loeber, 2003). There has been much less research carried out in the classroom with classroom teachers (Matheson & Shriver, 2005).

To deal successfully with non-compliance in the classroom, teachers need strategies that have been empirically proven in the classroom situation. It is the aim of this review to consider empirical research that examined interventions implemented by teachers to deal with non-compliant behaviour by students with and without disabilities in both regular and special education classroom situations. The following questions guided this review:

1. What intervention strategies addressing non-compliance are available to teachers?
2. How effective are these strategies?
3. Can intervention strategies be easily implemented by teachers in their classrooms without additional support?

Method

A search of computer databases (ERIC, 1997 to present; PsycInfo, 1997 to present; Google Scholar, 1997 to present) was conducted using the descriptors compliance/non-compliance, disobedience, resistance, off-task, behaviour disorders and behaviour modification, in combination with interventions, student behaviour, school/classroom, classroom techniques, behaviour momentum, effective commands, precision requests and compliance training to locate relevant papers published in refereed journals.

A search of the contents pages of the journals *Journal of Applied Behavior Analysis, School Psychology Review* and *Behavior Disorders* (selected as journals most likely to contain relevant studies) was also conducted. Finally, the reference lists of the relevant articles found during the search were reviewed to locate any further studies published between 1997 and the present.

Studies were included in this review if they met the following three criteria. First, if they examined the effects of interventions primarily aimed at increasing compliance. Second, if the interventions were carried out within the student's regular classroom within either a regular or special education setting. Third, if the interventions were implemented by regular teachers or in close cooperation with them.

Studies that were located were reviewed and information relating to students, service delivery mode, research design, intervention strategies, measures used, treatment effectiveness and teacher satisfaction was extracted and tabulated. In addition the studies that used specific interventions or intervention components were identified so the results of specific interventions strategies could be considered together.

Results

The search located 20 articles that met the criteria. The information extracted from the studies is summarised in Table 1. Non-compliance alone was the focus of 12 studies but in 8 of the studies non-compliance was included under the measure of 'disruptive behaviour' (DeMartini-Scully, Bray, & Kehle, 2000; DuPaul & Hoff, 1998; Fabiano et al., 2004; Kehle, Bray, Theodore, Jenson, & Clark, 2000; Kelshaw-Levering, Sterling-Turner, Henry, & Skinner, 2000; Musser, Bray, Kehle, & Jenson, 2001; Theodore, Bray & Kehle, 2004; Theodore, Bray, Kehle, & Jenson, 2001).

Participants

A total of 278 students took part in the studies (37 females, 241 males). Of these, 132 males were involved in two group studies (Kapalka, 2005a, 2005b), 61 boys and 10 girls in Fabiano et al., (2004) and the rest of the students in

single-subject design studies.

Ten studies involved students with diagnosed emotional, behavioural or intellectual disabilities (Belfiore et al., 2002; Fabiano et al., 2004; Kapalka, 2005a, 2005b; Kehle et al., 2000; Maag & Anderson, 2006; Musser et al., 2001; Ray et al., 1999; Theodore et al., 2004; Theodore et al., 2001). The rest involved students with no identified disabilities.

Settings and interventionists

Eight studies took place in special education or resource rooms (Belfiore et al., 2002; Belfiore et al., 1997; Fabiano et al., 2004; Lee et al., 2006; Musser et al., 2001; Ray et al., 1999; Theodore et al., 2004; Theodore et al., 2001) and the rest in regular classrooms.

In 3 studies post-graduate students completing Master degrees or student teachers delivered the intervention (Belfiore et al., 2002; Belfiore et al., 1997; Lee et al., 2004). In the other 17 studies the classroom teacher delivered the intervention. In one instance a parent was involved in the intervention (Ray et al., 1999). In all cases the interventions were designed and directed at least in part by researchers. Researchers trained teachers as part of several interventions, especially in studies involving effective commands or precision requests (DeMartini-Scully et al., 2000; Ford et al., 2001; Kapalka, 2005a; Maag & Anderson, 2006; Matheson & Shriver, 2005).

Experimental Designs

The two Kapalka studies (2005a, 2005b) employed group designs. The participants in these studies were teachers of students with ADHD referred to a clinic for behavioural problems, including non-compliance. Fabiano et al. (2004) also used a group design which compared versions of a structured behaviour management system using rewards and response cost, with and without a time-out component. Seventeen studies were single-subject designs. Most studies reported only on the immediate effects of the intervention, while five studies included a follow-up component (Ardoin et al., 1999; DeMartini-Scully et al., 2000; Ford et al., 2001; Musser et al., 2001; Ray et al., 1999).

Measures

The single-subject design studies used direct observational measures. There was, however, some variation in the operational definitions of compliance. For example, Austin and Agar (2005) and Ardoin et al. (1999) considered that a student was compliant if the task was initiated and completed within 20 seconds of the teacher's request, while Matherson and Shriver (2005) required compliance within 5 seconds. Some studies (Ardoin et al., 1999; Belfiore et al., 2002; Belfiore et al., 1997; Lee et al., 2006; Lee et al., 2004; Maag & Anderson, 2006; Wehby & Hollahan, 2000) measured latency to comply in seconds, without defining compliance and non-compliance. Lee et al. (2006) used a measure of task completion to monitor compliance with academic requests. In the studies that included non-compliance as a component of

disruptive behaviour (DeMartini-Scully et al., 2000; Fabiano et al., 2004; Kehle et al., 2000; Kelshaw-Levering et al., 2000; Musser et al., 2001; Theodore et al., 2004; Theodore et al., 2001) a number of behaviours were grouped with non-compliance. These included out of seat, talking out of turn, looking the wrong way, off-task, verbal and/or physical aggression and making noise.

Two studies gave results from behaviour questionnaires completed by teachers on student behaviours. Two group designs (Kapalka, 2005a, 2005b) used an abbreviated version of Barkley's Schools Situation Questionnaire, which included only those situations directly related to non-compliance, pre and post intervention.

Treatment effectiveness

All the interventions covered in this review reported positive effects on levels of compliance and/or reduction of disruptive behaviours. However, in two studies (Ardoin et al., 1999 and Austin & Agar, 2005) one participant did not have a satisfactory response, probably because of poor levels of treatment integrity.

Treatment integrity

Treatment integrity was examined in 10 of the studies (Ardoin et al., 1999; Austin & Agar, 2005; Belfiore et al., 2002; DeMartini-Scully et al., 2000; Ford et al., 2001; Lee et al., 2004; Musser et al., 2001; Theodore et al., 2004; Theodore et al., 2001; Wehby & Hollahan, 2000). It ranged from 86% to 100% in all but two components of two studies. In Ardoin et al. (1999) reinforcement for compliance for one student was delivered on only 56% of required occasions and in Austin and Agar (2005) praise for one student was delivered on only 50% and 40% of required occasions. In each case this poor level of treatment integrity was linked with a less than effective outcome.

Teacher satisfaction

The level of teacher satisfaction was reported in 12 of the studies. Six studies used a rating scale which measures intervention acceptability, either the Intervention Rating Scale (IRS-15) (Ardoin et al., 1999; Ford et al., 2001; Theodore et al., 2004; Theodore et al., 2001) or a scale developed from this instrument (DeMartini-Scully et al., 2000; Musser et al., 2001). In all cases except one, satisfaction was good to high. In Ford et al. (2001) the time out component received an unacceptable rating. In three studies teachers were interviewed to determine their satisfaction (Austin & Agar, 2005; Kelshaw-Levering et al., 2000; Matheson & Shriver, 2005). Feedback was positive, except in Matheson and Shriver where one teacher was not comfortable increasing verbal praise.

Strategies Used in Interventions

There were 15 separate strategies reported, both antecedent and consequent. Five studies examined only one strategy. Four of these involved behavioural momentum applied to academic compliance (Belfiore et al., 2002; Belfiore et al., 1997; Lee et al., 2006; Lee et al., 2004) and the

other sound-field amplification (Maag & Anderson, 2006). Three studies endeavoured to analyse the effectiveness of the individual strategies within multi-component interventions. Matheson and Shriver (2005) examined effective commands with and without praise, Ford et al., (2001) examined the effect of adding time in and time out components to a multi-component intervention that included effective commands and Fabiano et al. (2004) also examined the effect of adding time-out to a structured behaviour management intervention employing a token economy for rewards and response cost.

Behavioural Momentum. In this strategy, used in eight studies (Ardoin et al., 1999; Austin & Agar, 2005; Belfiore et al., 2002; Belfiore et al., 1997; Lee et al., 2006; Lee et al., 2004; Ray et al., 1999; Wehby & Hollahan, 2000), a sequence of three or four requests or tasks that a student is highly likely to comply with or complete (high-p requests) is followed by a request or task which is unlikely to be complied with or completed (low-p request) (Stephenson, 2006). Once a compliance momentum is established during the high-p sequence it is hoped that it will carry on to the low-p request, thus producing a greater likelihood of compliance (Nevin, 1996). In order to carry out this strategy a number of low-p and high-p requests or tasks specific to the student must be chosen and tested for compliance levels with the student prior to the intervention. It has been used for compliance with academic requests (Belfiore et al., 2002; Belfiore et al., 1997; Lee et al., 2006; Lee et al., 2004; Wehby & Hollahan, 2000) and compliance with requests for appropriate social behaviour (Ardoin et al., 1999; Austin & Agar, 2005; Ray et al., 1999).

Usually verbal praise is given for compliance with low probability requests (Stephenson, 2006, p. 42). However, this was only specified in four out of the eight studies using behavioural momentum (Ardoin et al., 1999; Austin & Agar, 2005; Ray et al., 1999; Wehby & Hollahan, 2000). The other four studies (Belfiore et al., 2002; Belfiore et al., 1997; Lee et al., 2006; Lee et al., 2004) simply alternated academic tasks the student was highly likely to complete with, with academic tasks the student was less likely to complete.

Effective commands and precision requests. Commands may be classified as *alpha* or *beta* commands. Alpha commands are specific and direct, given one at a time and followed by a wait period of 5 seconds (Forehand & McMahon, 1981; Matheson & Shriver, 2005). Beta commands (less effective) may be chain commands containing more than one verb, (that is, a number of commands given at the same time); may be vague; may be given in the form of a question; may be 'let's' commands; may be commands given with a lot of additional words or explanation (Forehand & McMahon, 1981; Matheson & Shriver, 2005).

Precision requests are a further development of single effective demands, and provide a sequenced

structure for commands. This approach was used in three studies (DeMartini-Scully et al., 2000; Kehle et al., 2000; Musser et al., 2001) The words "please" and "need" are used in the first and second request respectively, (e.g. "Please look at the board", "You need to look at the board"). Precision requests include other elements such as eye contact, proximity and use of a quiet firm tone. Compliance with a precision request should be followed by a positive consequence (DeMartini-Scully et al., 2000).

Praise for compliance. Verbal praise given following compliance was a specific component of 10 studies (Ardoin et al., 1999; Austin & Agar, 2005; DeMartini-Scully et al., 2000; Ford et al., 2001; Kapalka, 2005b; Kehle et al., 2000; Matheson & Shriver, 2005; Musser et al., 2001; Ray et al., 1999; Wehby & Hollahan, 2000). In those studies involving behavioural momentum the praise followed compliance with low-p demands only in the Ardoin et al. (1999) study, praise for all compliant responses was delivered in Ray et al., (1999) and Wehby and Hollahan (2000), while in Ray et al. (1999) praise for all compliant responses was delivered, along with some edibles in some phases of the intervention. While praise was not assessed independently in any of the studies reviewed it was effective in increasing the positive results of other strategies.

Eye contact. This strategy was linked with the use of effective commands in four studies (Ford et al., 2001; Kapalka, 2005a, 2005b; Ray et al., 1999). Kapalka (2005b) studied the effects of making eye contact prior to delivering a command and of keeping it for a further 15 seconds following the command – "the stare". This combination was effective in improving compliance with five to ten year olds and is part of the precision request strategy.

Proximity to the subject. This strategy, involving standing within 3 feet (1 metre) of the subject when the command was given was linked with effective commands/instructions in the Ford et al. (2001) and Ray et al., (1999) studies. This is not a stand alone strategy but is used as part of the effective or precision command strategy.

Tone of voice. This strategy was also linked with effective commands in three studies (DeMartini-Scully et al., 2000; Ford et al., 2004; Kapalka et al., 2005b) and involved using a quiet, firm tone of voice when delivering commands.

Avoidance of repetitions. Kapalka (2005a) combined the use of effective commands with the strategy of only repeating a command once then giving a warning of a consequence which would be carried out if the command was not complied with. This sequence was to be followed consistently. This combination resulted in a significant improvement in compliance.

Sound-field amplification. Maag and Anderson (2006) used a sound-field amplification system to bring the teachers voice to a level of 15dB evenly throughout the classroom. This involved the use of speakers set either in the back

or centre of the classroom with the teacher wearing a cordless microphone. The aim was to increase the volume of the directions to allow the students to hear them more clearly and to follow them.

Time-out. Time-out is a consequence strategy where the student is deprived of the opportunity to receive positive reinforcement or any positive interaction with the teacher for a period of time. Release from time-out is contingent on appropriate behaviour for a short period (Ford et al., 2001). This is usually accomplished by removing the student to a quiet place away from the rest of the class. It is intended as a form of punishment applied for non-compliance. Time-out was not used as a stand alone strategy and the results are limited. In Ford et al. it was only used on two students and in the Fabiano et al. (2004) study it was used in a special class with highly trained teachers and aides, not a regular classroom.

Group contingencies. Three studies examined group contingencies. Theodore et al. (2004) compared three different conditions. In independent group contingencies, the same contingency applied to the whole group but rewards were delivered on an individual basis. In interdependent group contingencies, all the students in the group needed to meet the criterion before reinforcement was delivered to all students. In the dependent group contingency, reinforcement for the whole group depended on the performance of one student selected at random. They found all were effective, with a small advantage to the dependent group contingency. Theodore et al. (2001) used an intervention that employed randomly chosen criteria (interdependent and dependent) as well as randomised rewards if the selected criterion was met. This intervention also reduced non-compliance. Kelshaw-Levering et al. (2000) compared interdependent group contingencies with random reinforcers with a condition where the behaviour to be rewarded, the criterion for the reward and the nature of the contingency (reward for whole class meeting the criterion or for a randomly selected student meeting the criterion). They found that randomising all components was slightly more effective at reducing disruptive behaviour than just randomising reinforcers.

Tokens, tangible rewards and mystery motivators. These are usually awarded following appropriate behaviours as set by the teacher, sometimes in consultation with the student. Like praise, they are intended as a reinforcer for appropriate behaviour. The use of the mystery motivator or random selection of a reward seems to hold a special attraction for the students as the nature of the reward is unknown until it has been delivered. These usually form part of a multi-component intervention rather than being used as a stand alone strategy and were used in several studies (DeMartini-Scully et al., 2000; Fabiano et al., 2004; Kehle et al., 2000; Kelshaw-Levering, 2000; Lee et al., 2006; Maag & Anderson, 2006; Musser et al., 2001; Theodore et al., 2001).

Overall the intervention studies reviewed

found that non-compliant and disruptive behaviour could be decreased by the application of a variety of strategies used singly or more often as part of multi-component interventions. The strategies and interventions were, in general, acceptable to teachers who found them to be effective and relatively easy to implement.

Discussion

As Walker et al. (2004) note, non-compliance very often leads into more serious antisocial behaviour and behaviour disorders. They also note that compliant behaviours are highly valued by teachers. It is therefore important for teachers to deal with non-compliance early and effectively. This review has identified a variety of strategies, both antecedent and consequence based, which have been applied successfully to deal with non-compliance and are available to teachers. Multi-component interventions have been very successful in decreasing non-compliant and disruptive behaviour in classroom situations. They have also received a high level of teacher satisfaction. It is surprising that only 20 studies meeting the criteria were identified, but given that the majority of the interventions were successful and most were based on established principles of behaviour analysis, the findings do provide useful guidance for teachers.

Criteria for establishing research-based practice

Horner et al. (2005) proposed standards for determining whether the research on a particular intervention provided a firm base for that intervention to be recommended as an evidence-based practice. They suggested that there needed to be a minimum of five single-subject studies that were methodologically sound and published in peer reviewed journals. The studies should have been conducted by at least three different research groups in different locations and include a total of more than 20 students. Shinn, Walker, and Stoner (2002) suggest that for an intervention to be considered as evidence based, there should be at least two between group studies, a combination of group and single subject studies, or at least two single-case design studies, with a minimum of 30 subjects where an intervention has been shown to be effective. Two strategies used in the studies reviewed satisfy these criteria, behavioural momentum and effective delivery of commands including precision requests. In the studies reviewed their effectiveness was enhanced when used in combination with verbal praise (Ardoin et al., 1999; Austin & Agar, 2005; Ford et al., 2001; Matheson & Shriver, 2005; Ray et al., 1999; Wehby & Hollahan, 2000).

The use of group contingencies (Kelshaw-Levering et al., 2000; Theodore et al., 2004; Theodore et al., 2001) drew on strategies shown to be effective in empirical studies prior to the period covered in this review. A meta-analysis (Stage & Quiroz, 1997, p. 13) has demonstrated that group contingencies were effective in reducing disruptive behaviour in general, and they have been shown to

be effective in interventions to change a range of student behaviours (Alberto & Troutman, 2006).

Behavioural momentum, effective delivery of commands and group contingencies can therefore be regarded as having a strong empirical support. Other strategies such as mystery motivators or randomly chosen rewards (DeMartini-Scully et al., 2000; Musser et al., 2001), response cost (DeMartini-Scully; Fabiano et al., 2004; Musser et al.,), time-out from positive reinforcement (Fabiano et al., 2004; Ford et al., 2001) also have strong support from earlier research (Alberto & Troutman, 2006) and are likely to be effective intervention components.

One strategy has not been researched thoroughly enough to enable recommending it as empirically tested in a classroom situation. There is limited research on sound-field amplification as studied by Maag and Anderson (2006). Maag and Anderson noted that there had been only four prior studies and these were flawed. In addition, the specialised equipment needed reduces its applicability to most settings.

Principles to guide interventions

Some general principles to guide interventions for noncompliance can be drawn from this body of literature. First, it is important that instructions and commands given to students are clear and are comprehended by the student. The guidelines for alpha commands and precision requests are useful here. Associated practices such as delivering requests in proximity to the student, with eye contact and in a quiet firm voice should also be used. Second, it is important that compliant behaviour be rewarded with potentially reinforcing consequences. All interventions provided positive consequences for compliance, most often verbal praise, but other reinforcers were also employed. The use of group reinforcers may be easier for many teachers to manage than the use of individualised reinforcers and they appear to be effective. Third, it is worth considering negative consequences for noncompliance such as response cost or time-out within a generally positive intervention.

Ease of implementation of strategies in the classroom

The identification of empirically supported practices is insufficient on its own, such practices need to be acceptable to teachers to cross the research to practice gap. Four criteria need to be considered in regard to how easily strategies can be implemented by teachers: simplicity, time, cost and level of training or support required. Teachers are most likely to accept, and use with integrity interventions that are easy to implement, are not time-intensive, are positive, are perceived to be effective by the teacher and are compatible with the environment in which they are to be used (Landrum et al., 2003). Strategies that involve intensive training and high levels of support are unlikely to be taken up by teachers (Walker, 2004).

Most of the strategies reviewed satisfy the criteria for simplicity, time and cost.

While all may require some training and teachers would likely benefit from support, the simplicity of most strategies suggest training and support need not be intensive. Strategies such as behavioural momentum and the use of verbal praise for compliant behaviour are relatively easy to use once the basic principles are understood. Even the more complex multi-component interventions that show potential for effectiveness were reported to be acceptable by teachers. Most of the multi-component intervention strategies would require some training of the teacher in command delivery (effective commands or precision requests).

The treatment integrity data reported also demonstrates that most interventions can be faithfully implemented in classrooms. The data from Ardoin et al. (1999) and Austin and Agar (2005), on failed interventions do, however, highlight the importance of treatment integrity.

Bringing the research into the classroom

Given that research-based strategies are available and are relatively simple to implement, it might be asked why teachers continue to report major problems with compliance. There is surely an argument for including basic strategies such as giving clear instructions and rewarding compliance in initial teacher education programs. It might be thought that such practices are basic and common sense, however, the research clearly shows that many teachers who report difficulties with compliance or who are working with students with more challenging behaviours do not automatically use these strategies. It would appear then, that such strategies also need to be addressed as part of ongoing professional development programs. Support teachers working with classroom teachers experiencing difficulties with compliance may need to consider assisting teachers to learn to use basic strategies (Witt, VanDerHeyden, & Gilbertson, 2004).

As well as assistance from support teachers, other forms of professional development may be suitable to disseminate basic strategies. Academic journals are not generally accessible to teachers (although the Journal of Applied Behavior Analysis is freely available on the Web). Teachers do not typically find and read this material (Rudland & Kemp, 2004). Teacher access to simplified reviews of current research applicable to their classroom situation would enable them to be more aware of the possibilities and strategies available to them. Little, Hudson, and Wilks (2002) found that the use of "tip sheets" in conjunction with short one-on-one training and follow-up for teachers was successful in dealing with lower levels of behaviour problems. The "tip sheets" were behaviour specific and included a simple description of the behaviour and its effect on the student and their classmates followed by suggested strategies to deal with the behaviour and finally a step-by-step summary. These sheets were well received by the teachers and the tips were generally followed with

moderate to high levels of integrity. This method could easily be used in schools with either the support teacher or an experienced mentor as the trainer. The use of in-school personnel has been found to be preferred by teachers experiencing problems within their classes (Little, 2005; Martin, Linfoot, & Stephenson, 1999; Stephenson et al., 2000).

Conclusion

It is clear from the studies reviewed above that a range of empirically based intervention strategies to manage non-compliance in students are available. These strategies have been found to be both successful in improving compliance and decreasing disruptive behaviour, and were acceptable to the teachers using them. However, they are not apparently being used consistently by many teachers who continue to report problems with compliance. Given the importance of student compliance for both their own education and that of other students in their classes there is a great need to bridge the gap between the research and classroom practices. There needs to be a communication channel, accessible to teachers, through which this information can be passed on to them. Further study into this area exploring approaches such as tip sheets is indicated. It would also seem that relatively low-key professional development approaches combined with effective pre-service education would have considerable potential to reduce non-compliant behaviour in schools.

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Table 1. Summary of Intervention Studies Aimed at Increasing Compliance in Classrooms

Study	Students & setting	Research design	Intervention stragegy	Treatment effectiveness	Teacher satisfaction
Ardoin, Martens, & Wolfe (1999)	1 male, 2 female, aged 7-8 yrs Regular classroom with regular teacher	Baseline + multi-element Follow up	Behavioural momentum High probability sequence with fading	Effective for 2 out of 3 participants	Intervention Rating Profile- 15 Mean of 5.7 on a 6 point scale
Austin & Agar (2005)	4 males, aged 4-6yrs Regular classroom with regular teacher	Reversal design ABAB No follow up	Behavioural momentum plus verbal praise	3 out of 4 students showed increased compliance	Reported as "teacher friendly"
Belfiore, Lee, Scheeler, & Klein (2002)	1 male, 1 female, aged 10yrs 1 with ED, 1with LD Self-contained classroom in elementary school with student teacher	Alternating treatment design with reversal components No follow up	Behavioural momentum 1. Traditional high probability sequence (3 high / 1 low probability request) 2. Traditional sequence with escape	Traditional high probability sequence effective Additional escape mechanism did not add much Effective in reducing latency for compliance	Unknown
Belfiore, Lee, Vargas, & Skinner, (1997)	2 females aged 14-15yrs Regular classroom in alternative school External investigator	Alternating treatments	Behavioural momentum	Effective in reducing latency for compliance	Unknown

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Study	Students & setting	Research design	Intervention stragegy	Treatment effectiveness	Teacher satisfaction
DeMartini-Scully, Bray, & Kehle, (2000)	2 females + 1 female control Regular classroom with regular teacher	Multiple baseline with reversal across individuals	Multi-component including: Precision requests Rule display Tokens and mystery motivator Response cost Verbal praise Contingency contract	Significant improvement in behaviour	Scale based on Intervention Rating Profile Mean rating of 4.7 on a 5 point scale
Fabiano et al (2004)	61 males, 10 females Special education classrooms with regular teacher	Group design	1. Addition of time out to existing behavioural treatment package 2. Duration of time out 3. Time out with positive and negative contingencies 3. Setting – classroom versus recreational settings	Significant improvement in on-task behaviour	Unknown

Ford, Olmi, Edwards, & Tingstrom (2001)	3 male, 1 female, aged 5-6yrs Regular elementary school classrooms with regular teachers	Multiple baseline across subjects Follow up	1. Effective instruction delivery with reinforcement for compliance 2. Effective instruction delivery with addition of positive verbal praise at least 80 times per day for positive behaviour other than compliance 3. As in 2 above with addition of time out for non-compliance	1. Effective Instruction Delivery phase effective (21-44% increase) 2. Effective Instruction Delivery/Time In phase effective (12-18% above 1) 3. Effective Instruction Delivery/Time In/Time Out phase effective though only delivered on 2 occasions	Intervention Rating Profile-15 Total scores 1. mean 79 Time In mean 80.5 Time out mean 50.25 Mean 52.5+ is acceptable
Kapalka (2005a)	86 males aged 5.5-9.9 yrs with ADHD Regular classrooms with regular teacher.	Group design No follow up	Effective commands + avoidance of repetitions of commands + consequence for non-compliance	Significant reduction in non-compliance reported	Unknown
Kapalka (2005b)	46 males with ADHD Regular classrooms with regular teachers after instruction from clinicians	Group design No follow up	Giving effective commands – focus on eye contact: 1. With eye contact (no stare) 2. Extended eye contact of 15-20 seconds following command (stare)	Both stare and no stare groups showed significant improvement Stare offered significant improvement over no stare	Unknown

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Study	Students & setting	Research design	Intervention stragegy	Treatment effectiveness	Teacher satisfaction
Kelshaw-Levering, Stirling-Turner, Henry, & Skinner (2000)	7 males, 5 females in 2nd grade regular classroom with regular teacher	Multiphase time-series ABACBC Two baseline conditions	1. Interdependent group contingency with randomized reinforcers (RR+) 2. Interdependent group contingency with all components randomized (R-all)	RR+ phase: Significant decrease in disruptive intervals R-all phase produce a further decrease and was more stable	Found procedures acceptable and carried on after study
Lee, Belfiore, Ferko, Hua, Carranza, & Hildebrand, (2006)	Experiment 1 1 male, 1 female aged 6 yrs	AB design	Behavioural momentum	Latency to complete H and L increased from baseline. H more than L H-L latencies were lower than L-H	Unknown
	Kindergarten class in day centre Teachers aide	No follow up			
	Experiment 2 1 male, 1 female in 5th grade	Alternating treatments design	Behavioural momentum Behavioural momentum + tokens for low probability problems completed	Behavioural momentum did have an effect Addition of tokens only produced a slight decrease in L-H latency	
	Resource room teacher	No follow up			

Lee, Belfiore, Scheeler, Hua, & Smith (2004)	Study 1 1 male, 1 female aged 7 yrs Regular classroom with regular teacher	Multiple baseline across students No follow up	Behavioural momentum	Higher productivity achieved	Unknown
	Study 2 2 males, 2 females, aged 10-11 yrs with LD Resource room with trained graduate assistant	Alternating treatment design No follow up	Low-probability + tokens High-probability/low-probability Behavioural momentum with tokens given for low probability problems completed	Mean latency deceased with each stage for 3 out of 4 subjects	
Matheson & Shriver (2005)	2 male, 1 female in 2nd and 4th grade general education classrooms with regular teachers	Multiple baseline across students No follow up	1. Effective teacher commands 2. Effective teacher commands + verbal praise	Use of effective commands was effective in increasing both compliance and academic behaviour, and decreasing competing behaviours Addition of praise increased positive results	Interview All comfortable with effective commands 2/3 comfortable with verbal praise All saw benefit

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Study	Students & setting	Research design	Intervention stragegy	Treatment effectiveness	Teacher satisfaction
Musser, Bray, Kehle, & Jenson (2001)	3 males, 2 females, aged 8, 9 and 10yrs Self contained classroom in school for children with serious ED	Multiple baseline across individuals Follow-up	Multi-component including: Precision requests Public rule posting Teacher movement Mystery motivators Token economy with response cost	Percentage of disruptive intervals measured Student 1 decrease from 39% to 9% average intervention and follow up Student 2 decreased from 36% to 9% average intervention and 12% average at follow up Student 3 decreased from 36% to 12% average intervention and 11% average at follow up Control students remained consistent at 36% and 43%	Mean satisfaction of 4.75 on a 5 point scale
Ray, Skinner, & Watson (1999)	Male, aged 5yrs Special class – autism Classroom teacher and mother	Baseline + multi-element design Follow up	Behavioural momentum High probability sequence + fading where: High probability request are those delivered by mother Low probability requests are those delivered by teacher	High level of effectiveness	Unknown

Theodore, Bray, & Kehle (2004)	Adolescent males with ED & ODD Special education class with regular teacher	Alternating treatments design	Group contingencies Comparison of independent, interdependent, and dependent Display of class rules Use of reinforcers	All three group oriented contingencies reduced disruptive behaviours Dependent contingency slightly more effective than others	Intervention Rating Profile Mean of 4 on a 5 point scale
Theodore, Kehle, & Jenson (2001)	5 adolescent males with ED Special education class with regular teacher	Reversal design ABAB	Group contingency program with randomised criteria and reinforcements	Immediately and dramatically effective	Intervention rating profile 5 point scale Mean 5 – strongly agree
Wehby & Hollahan, (2000)	1 female, aged 13yrs with LD General education classroom with regular teacher	ABABACB A-low-p requests B-high-p sequence C-Neutral social comments No follow up	Behavioural momentum + neutral social comments sequence	Decrease in latency during high-p sequence from 677s (mean) to 21s (mean) Effect on duration of engagement unclear	Unknown

Note. LD – Learning disability; EBD – emotional and behavioural disability; ED – Emotional disorder; BD Behavioural Disorder; ODD – Oppositional defiance disorder; ADHD – Attention deficit hyperactivity disorder