

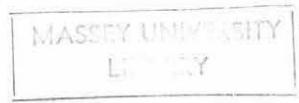
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*The Comparison of the Efficacy of Four
Behavioural Procedures' Ability to Reduce
Disruptive Classroom Behaviour.*

A THESIS PRESENTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN
PSYCHOLOGY AT MASSEY UNIVERSITY.

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ABSTRACT

This research focused on the comparison of four behavioural procedures and their effectiveness at reducing disruptive classroom behaviour. Subjects who participated in this research were males and females, aged seven to nine in two typical primary school classrooms, in Palmerston North. Their ethnicities included Caucasian, Maori, Indian, Pacific Island and Sri Lankan. The procedure the school currently used to reward and discipline the children was compared with response cost plus positive reinforcement, the chance to earn back lost time after a specified period of appropriate behaviour and the chance to earn back lost time after displaying appropriate behaviour for a longer period of time than was previously required. Results found that the children's disruptive behaviour decreased the most with the use of response cost plus positive reinforcement.

However, due to reasons of acceptability to the teachers and students, this procedure was not continued. Instead, the more acceptable and less stringent earn back time procedures were used and compared. From this, it was found that the earn back time procedure which required the children to behave appropriately for longer was the most efficacious in reducing disruption. Overall, this research supported the efficacy of response cost plus positive reinforcement for reducing disruptive behaviour in the classroom, while earning back time (and having to display appropriate behaviour longer) was shown to be second most effective.

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INTRODUCTION

THE PROBLEM

Disruptive children pose a problem in classrooms which affects nearly every school in some way (Rapport, 1983), including other pupils as well as their teachers (O'Brien, 1982). "Disruption" has many connotations and definitions. What one person may see as disruption, another may see as hyperactive, restless, or simply playful behaviour. However, disruptive children are typically described as being impulsive and restless, with a short attention span (O'Brien, 1982), and having an inability to focus on or carry out assigned group and individual activities typical of classrooms (Johnson, 1988; Rapport, 1983; Rapport, Murphy & Bailey, 1980; Shepp & Jensen, 1983; Whalen & Henker, 1976).

These children have a range of problems which they experience differently in their type of symptoms and their intensity. They may be inattentive (O'Brien, 1982), overactive, and exhibit a variety of externalising behaviours, such as less verbal control of inhibitory responses, and greater numbers of errors on motor tasks (Hobbs, Moguin, Tyroler & Lahey, 1980), along with academic deficiencies (Abramowitz & O'Leary, 1991). Disruptive children often talk excessively and loudly, interrupt others, blurt out answers to questions before the questions have been fully stated, do not listen, are poor at following directions, produce careless or messy work, fail to wait for their turn in group situations or to follow the rules in structured

games, fidget, wiggle, and manipulate objects (Johnson, 1988). These problems are often extreme and persistent (Johnson, 1988).

Schools are continually faced with problems caused by disruptive behaviour (O'Brien, 1982; Wade & Moore, 1984). Disruptions not only affect the child's learning and social interactions, but also those around the child, who often have their own work disrupted (McGill & Crowther, 1990; Wade & Moore, 1984; Whalen, Henker, Swanson, Granger, Kliewer & Spencer, 1987). Disruptive children are perceived as annoying and aversive by their peers (McGill & Crowther, 1990; O'Brien, 1982; Whalen et al., 1987), and social disharmony is commonplace (Henker & Whalen 1989). These children can have difficulty making and keeping friends, and adults often view their behaviour with peers as inappropriate and aggressive (Dierenfield, 1982; Gottfredson, 1986; Landau & Moore, 1991). Disruptive children have been found to display behaviour which is assaultive at times toward both fellow pupils and their teachers (Dierenfield, 1982). These behaviours can result in rejection from their peers, with great human cost being involved (Landau & Moore, 1991). Such social difficulties can be both pervasive and enduring, with interpersonal conflicts and confrontations being the norm (Whalen et al., 1987). Disruptive children evoke negative responses not only from their classmates, but also frequently from their teachers, which is directed not only toward themselves, but to the whole class (Landau & Moore, 1991).

Disruptive behaviour, if left unchecked can lead to increased teacher stress and pressures (Campion, 1994), child violence toward teachers (Campion, 1994; Dierenfield, 1982; Marston, 1994), and underachievement at school (Hinshaw, 1992; Marston, 1994). Aggressive

behaviour may also be displayed by disruptive children (Dierenfield, 1982; Wade & Moore, 1984), which can lead to serious problems for other students and teachers, such as physical abuse and suspensions (Gottfredson, 1986).

Serious disruptive behaviour may be classified as Attention Deficit Hyperactivity Disorder (ADHD) (American Psychiatric Association, 1987). The symptoms involved with this disorder are similar to those for other disruptive children, including the inability to concentrate for the same lengths of time as their peers, inattention to the task at hand, annoying those around them, restlessness, impulsivity, restlessness, answering questions before the whole question has been asked, and sleeplessness (Cantwell & Baker, 1991; Hogg, Callias & Pellegrini, 1986; Houlihan & Van Houten, 1989; Kaplan & Sadock, 1991).

Other diagnoses that have been used for the same group of disruptive behaviours included hyperkinetic impulse disorder (Rapport, 1983), Brain Damage Behavior syndrome (Cantwell & Baker, 1991), or Minimal Brain Dysfunction (Cantwell & Baker, 1991), hyperkinesis (Holborrow, Berry & Elkins, 1984) and Attention Deficit Disorder - with or without hyperactivity (American Psychiatric Association, 1987). Terms such as "hyperkinesis" and "hyperactivity" are commonly used in describing such children (Biederman, Newcorn & Sprich, 1991; Cullinan, Epstein & Lloyd, 1983; Holborrow et al., 1984).

The symptoms of ADHD have been the focus of much research (Davison & Neale, 1990; Johnson, 1988; Kaplan & Sadock, 1991; McGill & Crowther; 1990; Solanto, 1990). Disruptive children share a lot of the same difficulties as children who have been formally diagnosed as

having ADHD, and this classification is frequently given to children who display many of the behaviours shown by disruptive children.

The prognoses for disruptive children whether they be formally diagnosed as having ADHD or not, are not very good (Kaplan & Sadock, 1988; Landau & Moore, 1991). Landau and Moore (1991) argue that as they mature, such children are at greater risk for a variety of problems. Even though many of their symptoms have subsided by adulthood, these people judge themselves as being sad, lonely and as having few friends (Landau & Moore, 1991), along with significantly higher rates of depression, delinquency, juvenile convictions and alcoholism in later life (Biederman et al., 1991; Davison & Neale, 1990; Hinshaw, 1992; Kaplan & Sadock, 1988; Landau & Moore, 1991; Livingston, Dykman & Ackerman, 1990). Such problems can be continual for these people.

There is obviously a problem with such children in classes, and the effects of such behaviour should not be underestimated Holborow et al (1984). The important factor is that the children are having difficulties at school and that these troubles are detrimental to their learning. Although the children are usually of average intelligence, their academic productivity and performance is sub-standard when compared to their peers (Hogg et al., 1986; Houlihan & Van Houten, 1989; Solanto, 1990).

PREVALENCE

Prevalence estimates of disruptive children *per se* are difficult to find, possibly due to the problems in defining disruptive behaviour (Dierenfield, 1982; Johnson, 1989). What one person calls disruption, another may not. Without a formal means of classifying disruptive behaviour, estimates of its prevalence are difficult to make. Some people may also use the terms "hyperactivity" and "ADHD" when talking about disruption, so prevalence statistics of disruptive behaviour are often included with other diagnostic categories.

However, estimates of ADHD are well documented, although these estimates vary widely (Abikoff & Klein, 1992; Biederman et al., 1991; Henker & Whalen, 1989; Holborow et al., 1984; Johnson, 1988; Rapport, 1983; Szatmari, Offord & Boyle, 1989; Whalen & Henker, 1976; Whalen & Henker, 1991). Abikoff and Klein (1992) estimate that around 3% to 5% of school children are hyperactive. The term "hyperactive" may be used interchangeably by lay people, such as teachers and parents when describing disruptive children. This may include a range of disruptive behaviour, whether it be mild disruption or full scale ADHD. In their review, Biederman et al (1991) found between 2% and 9% to be a common estimate of the prevalence of ADHD. Henker and Whalen (1989) found that 50% or more classmates of hyperactive boys describe them as being such. In a sample of 1,900 primary school-aged children, Holborow et al (1984) found that 5% to 9% met the criteria for ADHD. Both Johnson (1988) and Szatmari et al (1989) found in research reviews of the prevalence of ADHD that prevalence figures ranged from less than 1% to 14.3% of children have the diagnosis of ADHD. Rapport (1983) reports prevalence ranged from 1.2% to 15% of the child population being diagnosed as hyperactive in the United States. He goes on to write

that there is approximately one child in every classroom with such problems when these figures are averaged out (Rapport, 1983). While Whalen and Henker (1976) and Whalen and Henker (1991) found figures close to this ranging from 3% to 20%. Boys seem to exhibit the symptoms of ADHD more than their female counterparts (Davison & Neale, 1990; Holborow et al., 1984; Johnson, 1988; Kaplan & Sadock, 1991; Livingston et al., 1990; Rapport, 1983; Szatmari et al., 1989). Regardless of exact figures, it is clearly evident that there is a substantial problem among children that poses difficulties for them and those around them.

There has been a lot of research based on the co-morbidity of ADHD with other disorders (Abikoff & Klein, 1992; Biederman et al., 1991; Cantwell & Baker, 1991; Frick, Kamphaus, Lahey, Loeber, Christ, Hart & Tannenbaum, 1991; Hinshaw, 1992; Livingston et al., 1990). Underachievement at school is often associated with ADHD and learning disabilities (Biederman et al., 1991; Cantwell & Baker, 1991; Frick et al., 1991; Hinshaw, 1992). Children who are not classified as ADHD, and who are merely labeled as being disruptive are also typically underachievers at school (O'Brien, 1982). Such disruptive behaviour may stem from the difficulties these children experience. Frick et al (1991) reviewed research concerned with such overlap and discovered that anywhere between nine and 48 per cent of children with ADHD also had learning disabilities. Hinshaw found that the disruptive behaviour disorders overlap in 10 to 50 per cent of all cases sampled with underachievement. Whereas, Cantwell and Baker (1991) found that 80 per cent of 11 year olds in their study diagnosed with ADD-H also had learning difficulties, and that this overlap resulted in lower academic achievement.

TREATMENT

Treatments for disruptive behaviour are usually drug treatments (Rapport, 1983), behavioural treatments (Cooke & Apolloni, 1976) or a combination of both (Abramowitz, Eckstrand, O'Leary & Dulcan, 1992).

Drug Treatments

Drug treatments are often given to children who are considered to be ADHD. Stimulant drugs, such as Methylphenidate (Ritalin), dextroamphetamine (Dexedrine), and pemoline (Cylert) are often used with children designated as hyperactive (Rapport, 1983; Henker & Whalen, 1989; Wulbert & Dries, 1977). The antidepressant imipramine (Tofranil) has also been used with them (Henker & Whalen, 1989), and currently Methylphenidate is the drug of choice (Henker & Whalen, 1989).

Methylphenidate is commonly used due to its cost efficiency and known effects on sustaining attention (Johnson, 1988), decreasing activity level (Rapport, 1983; Rapport et al., 1980), increasing academic output (Rapport et al., 1980) and creating more acceptable classroom behaviour (Rapport, DuPaul, Stoner & Jones, 1986). Medication can have a beneficial effect for children, whether they be classed as disruptive, hyperactive or labelled as ADHD. Methylphenidate has been shown to increase co-operation, involvement in tasks and the ability to inhibit inappropriate verbal exclamations (Landau & Moore, 1991). Drug treatment is also easy to use, as it only comprises the child ingesting a pill one to three times a day (Whalen & Henker, 1991). After receiving stimulant medication, the children's domineering and aggressive

behaviour decreases, while visual-motor performance is enhanced (Johnson, 1988). This is of particular relevance to children's performance at school. The use of Methylphenidate to treat children produces positive changes in their mothers' behaviour, due to the children's increased attention span, which is an obvious gain for these families (Johnson, 1988). Such drugs may be used with children regardless of a label of ADHD. Hence, children who are merely seen as being disruptive may also be given drug treatment.

However, there are drawbacks to the use of stimulant medication on these children, such as suppressed growth rates and emotional lability (Whalen & Henker, 1991; Whalen et al., 1987; Meadows & McLaughlin, 1988; DuPaul, Barkley & McMurray, 1991; Truhlicka, 1982). Drug treatments often fail to enhance the quality of disruptive children's academic accuracy, have various side effects, such as dysphoria (Whalen et al., 1987), result in stigmatisation for the child (Whalen & Henker, 1991), decrease social interaction (Meadows & McLaughlin, 1987; Whalen et al., 1987) and even the worsening of disruptive symptoms (DuPaul et al., 1991).

Behavioural Treatments

Behavioural techniques have often been more popular than drug treatments due to the above mentioned side effects (Houlihan & Van Houten, 1989). Behaviour modification has been used effectively by numerous researchers (e.g. Cooke & Apolloni, 1976; Duker & Rasing, 1989; Gurney, 1987; Muscott, 1987; Schreibman & Carr, 1978; Werry & Wollersheim, 1988) across broad spectrums of school populations ranging from disabled students to gifted students (for a review see Downing, Moran, Myles & Ormsbee, 1991), including disruptive children (Eyde & Fink, 1983; Duker & Rasing, 1989; Henry, 1987; Hinshaw, Henker & Whalen, 1984; Lentz,

1988; Muscett, 1987; Ninness, Fuerst Rutherford & Glenn, 1991). A variety of procedures have been used with disruptive children, including positive reinforcement (Foxx & Shapiro, 1978; Hundert, 1976; Iwata, 1987), group-managed contingencies (Page & Edwards, 1978; Salend & Lamb, 1986; Salend, Tingle & Balber, 1988) and negative punishment (Kazdin, 1972; Kendall & Braswell, 1982; Lovitt & Smith, 1974; Proctor & Morgan, 1991; Serna & Osborne, 1993; Solanto, 1990; Zirpoli & Lloyd, 1987).

Negative Punishment

Negative punishment is the withdrawal of a positive reinforcer contingent on the occurrence of a target behaviour (Cooper, Heron & Heward, 1987). The effect of negative punishment is to reduce disruptive behaviour directly. Two sub-types of negative punishment are time out from positive reinforcement (TO) and response cost (RC). The main distinction between the two sub-types is that with TO, a subject loses access to a reinforcer, whereas with RC, a subject's amount of possible reinforcement is reduced (Cooper et al., 1987). Stating this difference another way, the participant is removed to TO for emitting the inappropriate behaviour and no longer has the ability to emit appropriate behaviour, while on a RC system, the participant loses a specified amount of positive reinforcement for each occurrence of the undesirable behaviour, but is not removed from the situation, and still has the ability to display appropriate behaviour (Cooper et al., 1987; Werry & Wollersheim 1988; Zirpoli & Lloyd 1987).

Advantages of negative punishment procedures are that they are generally easy to use (Martens, Peterson, & Cirone, 1986; Martens, Witt, Elliott & Darveux, 1985; Witt, Martens & Elliott, 1984; Zirpoli & Lloyd, 1987), they are rated as highly acceptable by consumers (Heffer

& Kelley, 1987; Kazdin, French & Sherick, 1981; Little & Kelley, 1989; Miltenberger, Parrish, Rickert & Kohr, 1989; Witt & Martens, 1983), they rapidly suppress target behaviour (Cooper et al., 1987; Kazdin, 1972), and they can allow for alternative behaviours learnt are maintained well and often generalise to other settings (Bradley & Houghton, 1992; Broughton & Lahey, 1978; Hogg, Callias & Pellegrini, 1986; Houlihan & Van Houten, 1989; Myles, Moran, Ormsbee & Downing, 1992). Negative punishment procedures are also easy to combine with other behavioural strategies (Abramowitz, Eckstrand, O'Leary & Dulcan, 1992; Cooper et al., 1987; Kendall & Braswell, 1982; Shepp & Jensen, 1983).

The disadvantages of negative punishment procedures include the subject avoiding or escaping from the situation (Cooper et al., 1987; Iwata & Bailey, 1974; Kazdin, 1972). Although this tends not to be a problem with response cost, as the participant must remain in the environment for the specified period of time. The possibility of the participants becoming emotionally disturbed by the use of negative punishment procedures has also been of concern (Kazdin, 1972), including displays of more aggression and rebellion by participants (Cooper et al., 1987; Iwata & Bailey, 1974). However, this is not always found to occur (Iwata & Bailey, 1974; Kaufman & O'Leary, 1972).

Response Cost

Researchers have emphasised the need to include response costs for inappropriate behaviours as well as rewards for appropriate behaviours when working with disruptive behaviour in children (Henker & Whalen, 1989; Iwata, 1987). Many studies support the use of response cost procedures with disruptive school children (Boone Von Brock & Elliott, 1987; Du Paul,

Guevremont & Barkley, 1992; Elliott, Witt, Galvin & Peterson, 1984; Heffer & Kelley, 1987; Hoge & Andrews, 1987; Iwata & Bailey, 1974; Kazdin et al., 1981; Landau & Moore, 1991; Little & Kelley, 1989; Martens et al., 1985; Martens et al., 1986; Miltenberger, Parrish & Kohr, 1989; Proctor & Morgan, 1991; Rapport, Murphy & Bailey, 1982; Shepp & Jensen, 1983; Witt & Elliott, 1982; Witt & Martens, 1983; Witt, Martens & Elliott, 1984). Response cost has typically been done by placing tokens of some sort in the child's visual range, and then removing them one by one for each instance of inappropriate behaviour (Abramowitz et al., 1992; Bradley & Houghton, 1992; Hundert, 1976; Solanto, 1990). Other procedures have been commonly used with response cost, particularly positive reinforcement (Bradley & Houghton, 1972; Broughton & Lahey, 1978; Hundert, 1976; Salend et al., 1988).

Response cost can also be used constructively in the educational setting, as Broughton and Lahey (1978) did to raise the number of correct responses to academic assignments by pupils. If the children answered correctly, they gained a point, if their answer was incorrect, they lost a point (Broughton & Lahey, 1978). Points were exchanged for reinforcing activities (Broughton & Lahey, 1978). Accuracy of school work was increased successfully by this study. Other examples include Kaufman and O'Leary (1972) and Proctor and Morgan (1991) using the technique with disruptive teenagers, and Salend and Lamb (1986) and Salend et al (1988) successfully using response cost with the entire classroom managing the contingency. This shows the flexibility of response cost as a procedure which can be used to alter inappropriate behaviour to more desirable behaviours. Response cost is a very practical procedure to use in the classroom, as it not only discourages inappropriate behaviour, but it also encourages

desirable behaviour (Kazdin, 1972). The student is therefore told what is expected of him or her, and what the consequences will be if this is not done.

Response Cost With Or Without Positive Reinforcement?

Broughton and Lahey (1978) used response cost on its own, positive reinforcement on its own, and the two combined. They found that response cost was more successful in getting children to increase on-task behaviour and also in the accuracy of their school work, than positive reinforcement alone or both strategies combined (Broughton & Lahey, 1978). This may have occurred because the children found the combined strategy too complex to know what was owed to them and so they could not alter their behaviour to give them the most desired outcome (Broughton & Lahey, 1978). Whereas, with response cost alone, and positive reinforcement alone, the contingencies were simpler to follow and the children could alter their behaviour to suit the most desired outcome easier (Broughton & Lahey, 1978).

Others argue that it is beneficial to add positive reinforcement into a programme, as doing so allows the children to have something encouraging left for them once the study has been terminated (Cooper et al., 1987). This essentially should lead to greater maintenance effects (Bradley & Houghten, 1992; Cooper et al., 1987). Wade and Moore (1987) believe that positive reinforcement of appropriate behaviour is important when working with disruptive children. Solanto (1990) found that positive reinforcement and response cost both raised academic performance equally. Both strategies were not used in combination, however.

It may be unrealistic to give a child positive reinforcement alone, because when the research has ended, the child will find that one does not always get what one deserves in real life (Houlihan & Van Houten, 1989). Iwata (1987) writes that positive reinforcement alone is not enough, when the aim of the study is to extinguish behaviours, such as disruptiveness. Shepp and Jensen (1983) found that the combination of response cost and positive reinforcement was superior to that of a cognitive strategy or even the cognitive and operant strategies combined. Eyde and Fink (1983) and Gottfredson (1986) states that positive reinforcement is essential to reinforce displays of appropriate behaviour when working with disruptive children. Overall, support for the use of positive reinforcement in combination with negative punishment is demonstrated by these studies.

GENERALISATION AND MAINTENANCE

Hogg et al (1986) emphasise the need for researchers to use strategies that can be applied to real life situations. A response-cost procedure teaches children that inappropriate behaviour can lead to disadvantages for them, which is a phenomenon that occurs naturally (Houlihan & Van Houten, 1989). Therefore, the effects of a response cost programme should be maintained better outside of the classroom because the children will be used to being rewarded or punished fairly, according to the behaviour they have displayed. Delayed reinforcement, as would be experienced in this study, with the children collecting what they have earned at the end of the week, has also been found to increase the maintenance of behaviour (Fowler & Baer, 1981). It is also important to use reinforcers that occur naturally when aiming for the maintenance of effects (Bradley & Houghton, 1992; Cooper et al., 1987). Social praise, self-

management contracts and social interaction are all examples of natural reinforcers (Bradley & Houghton, 1992; Cooper et al., 1987; Gurney, 1987; Ninness et al., 1991). Strategies like this should be taken into account when designing an intervention such as that proposed.

By requiring the children to behave appropriately for a longer period of time over the course of the study, their behaviour should generalise and be maintained upon termination of the research (Cooper et al., 1987; Stokes & Baer, 1977). Bradley and Houghton (1992) did this with a seven year old girl who sucked her clothes, hair and fingers. She was required to go without sucking her thumb for 40 minutes. If this was not done, the child lost a sticker (response cost). After the initial phase of data collection, the child could only earn stickers every other day. This was extended to a weekly contingency. At six month follow-up, the girl had maintained the target behaviour (Bradley & Houghton, 1992).

The aim of any applied behaviour analysis should be to give the participants skills they can use even after completion of the research (Cooper et al., 1987). The generalisation of knowledge and skills to new settings is the ultimate goal of any teaching strategy (Blackbourn, 1989). It may be appropriate to incorporate positive reinforcement, such as social praise which occurs naturally to ensure that what is learnt is carried with the participants after completion of the study (See Bradley & Houghton, 1992). It may also be desirable to use a variety of people, or training exemplars (Gaylord-Ross, Haring, & Pitts-Conway, 1984; Stokes and Baer, 1977) such as the teacher and the experimenter to implement the programme, as this appears to help generalisation to other settings (Gaylord- Ross et al., 1984).

Generalisation and maintenance will be strengthened in this research by using the withdrawal of recess time for inappropriate behaviour, in combination with reinforcement of a social element (teacher praise) for appropriate behaviour. Reinforcement when given, will be intermittent, as the teachers may naturally fail to detect occurrences of appropriate behaviour each time it is displayed, and any reinforcement gained from the Star of the Week contingency will be received at the end of the week. Koegel and Rincover (1977) state that this intermittent reinforcement, which may be delayed strengthens the generalisation and maintenance of an intervention.

Acceptability Of Response Cost Procedures

A very important consideration for deciding on a strategy for altering behaviour is its level of acceptability to those using it. If an intervention is not acceptable to teachers, they are unlikely to implement it consistently (Witt, Moe, Gutkin & Andrews, 1984). Several studies found that response cost was rated as a highly acceptable intervention to use, and was rated by teachers as significantly easier to use than both consultation with a specialist and corporal punishment (Martens et al., 1986; Witt & Elliott, 1982; Witt & Martens, 1983; Witt, Martens & Elliott, 1984). In fact, Martens et al (1986) found response cost was rated as the most effective and easy to use strategy by teachers in their study.

Major considerations concerning how acceptable an intervention will be are the time it takes to implement it and the resources required to implement it (Witt and Martens 1983). However, these researchers found that manipulation of reinforcers in a response cost procedure was rated

as significantly easier to use than both consultation with a specialist and corporal punishment by teachers (Martens et al., 1986). Response cost was also reported to be used more by these teachers than time out (Martens et al., 1986). Martens et al (1985) found that teachers preferred to use response cost over sending a child to the principal's office. This may be because the children are still situated in the classroom and have the ability to continue learning with a response cost contingency. Further, time-out was rated as less acceptable than either response cost or token economy interventions (Boone Von Brock & Elliott, 1987). This gives support for the use of response cost versus time out.

Response cost is acceptable not only to teachers but also to the wider community. For instance, Boone Von Brock and Elliott (1987) found a high level of acceptability of response cost procedures within the professional community. It is also important however, to consider those people around the children, their family, who may also be involved with the intervention (Gottfredson, 1986). Family members can be taught techniques and given information so that the child is exposed to the same environment both at home and at school. This ensures that what the child is learning in one setting is being generalised to another setting. It also enhances the strength of the child maintaining the skills learnt. It is important that parents consent to the use of behaviour management procedures used by teachers with their children. Miltenberger et al (1989) found that parents and grandparents of disruptive children rated response cost, time out and differential reinforcement of other behaviour (DRO) to be significantly more acceptable than spanking and medication. Little and Kelley (1989) and Heffer and Kelley (1987) also found response cost procedures to be rated as highly acceptable by parents. Heffer and Kelley (1987) found mothers rated response cost and positive reinforcement as

significantly more acceptable than other treatments [time out, spanking and medication]. Again, support is given for the use of response cost as opposed to time out.

Burchard and Barrera (1972) highlight an important point when considering whether to use response cost or time out. These researchers believe that response cost is a more appropriate option than time out when working with disruptive children because in a response cost situation, children are still in the environment and they have the ability to engage in the undesirable behaviour again, whereas with time out, this opportunity is taken away from them (Burchard & Barrera, 1972). In fact, time out may be considered a more desirable option by the children themselves, as they are taken out of the situation in which they can be reprimanded (Burchard & Barrera, 1972; Kazdin, 1972; Zirpoli & Lloyd, 1987).

Therefore, a strong case can be made for the use of response cost with disruptive children. A disadvantage of using such a strategy is the possibility that the children will lose all their points fast, the person involved in implementing the procedure must consistently withdraw and add privileges according to the specifications of the programme, and the improvements demonstrated in the study may not be maintained (Little & Kelley, 1989).

This study investigated the effect of varying response cost procedures and the disruptive behaviour of children in a normal classroom. It was conducted in the context of an already existing procedure, which in part aimed at reducing disruptive behaviour. This procedure also included positive reinforcement. A response cost plus positive reinforcement procedure, coupled with two other strategies was used in the present study. These techniques gave the

children a chance to earn back the time they lost due to their inappropriate behaviour after varying times. This was then extended to a second classroom.

METHOD

SUBJECTS AND SETTING

Two classes of students participated in this study. Both classes were from the same Palmerston North primary school. Class one (Cl1) consisted of 16 females and 12 males, ages 8 to 9 years old. Class two (Cl2) was composed of 13 males and 18 females, with ages ranging from 7 to 8 years. Teachers of both classes were Caucasian females. The ethnicities of the children included Caucasian, Maori, Indian, Pacific Island, and Sri Lankan. These children were selected because they were students at a typical primary school. The children's intelligence levels varied, according to teacher reports, and the children were from all socio-economic backgrounds.

The study was conducted in two classrooms. Normal class activities continued during the study, and the research was conducted usually at three different times of the day so as to sample a range of the childrens' normal behaviour. The only minor changes to the normal classroom procedures was the presence of the researcher and a video camera with a timer attached to the camera. The researcher and equipment were in the same seating position in each class during all experimental phases. Activities the children participated in included; mathematics, reading, writing, language, art, comprehension, library visits, watching videos, singing, group discussions and music.

APPARATUS

A Panasonic video camera was to record classroom behaviour. It had a small battery-run timer on it, that made an auditory signal every 10 seconds to distinguish intervals. The video camera was equipped with a wide-angled lens, so it could be placed unobtrusively in the corner of a classroom, and still capture the room in its entirety.

OBSERVATIONS

Observations were made daily for three half hour periods on a continuous interval recording basis of 10 seconds. Experimental sessions were conducted over a ten week period, usually at 10:00 a.m. - 10:30 a.m., 12:00 p.m. - 12:30 p.m., and 2:30 p.m. - 3:00 p.m. most week days. Where this was not possible, the half hour closest to that scheduled was used. The teachers were always present during these times.

Response Definitions

The dependent variable was the occurrence of inappropriate behaviour. Inappropriate behaviour was the breaking of one or more of the rules as listed below. At the time of each rule violation, the teacher reprimanded the child vocally. For any instances where the teacher and researcher disagreed about violations, the researcher recorded it and discussed it later with the teacher. This occurred during the baseline phase, and only occasionally.

Categories of appropriate student behaviour were based on rules that the teachers had formerly established, which were very similar for both classes. These comprised:

- Quiet talking - no talking loudly or yelling so that other children were disrupted or interrupted.
- Hands up before talking - to participate in class discussion, a child had to first raise their hand and be invited by the teacher to talk..
- Respect property - respect to be shown to all property i.e., no damaging or breaking belongings, including school equipment.
- Respect others' feelings - taunting, annoying or worsening peer' or elders' emotional state was not allowed. Verbal fighting was specifically banned.
- No physical fighting - no pushing, punching, or hitting etc.
- Keep attention focused - concentrate on one's assigned activities.
- Ask permission to leave the room - request permission from the teacher to leave the classroom.
- Clean up after yourself - all equipment to be cleared away upon completion of any activity.

DEPENDENT VARIABLE

Prior to the research being conducted, naturalistic observations of the two classrooms were made over two days, prior to the commencement of the research. This was done to ensure that the children's disruption levels were high enough to warrant carrying out such research in the particular classroom.

The total number of times any rule was violated was recorded for each 10 second interval. This number included all violations by all children during each period. Individual's data was not recorded for the purposes of the results. It was however noted what children were making which disruptions. Consequently, rates of disruption were totals of all disruptions made by all children. The researcher was the primary observer. The dependent variables (DVs) were the children's disruptive behaviour and was rated in vivo by the researcher, and from the video tapes by the second observer.

INDEPENDENT VARIABLE

Prior to the research being conducted, the Star of the Week (SW) programme operated. The entire school used this system to govern all children. For the SW programme, the teacher put a tick by a child's name on the blackboard for appropriate behaviour, such as quietly staying on task. This also included activities such as sitting quietly on the mat, helping a fellow classmate and doing above average class work. The child with the most ticks at the end of the week received a SW award, which was a certificate and a lollipop to take home. This provided a delayed reinforcement contingency.

If a child misbehaved, his or her name was written on the blackboard under a "Warnings" heading. Once two ticks had been placed beside a child's name, his or her name was written into the teachers' book and the child was required to complete extra tasks as assigned by the

teacher. A child could avoid having to perform these tasks by displaying good behaviour for the rest of the school day. If, at the end of the day, a child had satisfied the teacher that he or she had behaved appropriately, his or her name was rubbed off the blackboard, and there were no further consequences. If a child's behaviour was inappropriate continually over the day, a note was sent from the school to the child's home regarding their inappropriate behaviour. If the disruptive behaviour still occurred, the parents were called into the school to discuss it with the teacher and the principal.

Lose Time

In the LT procedure, if a child violated a class rule, his or her name was written on the blackboard. Consequently, that child lost three minutes of the next play period, i.e. interval or lunch time. This meant that that child had to stay in class with the researcher and do some follow-up class work as assigned by the teacher. If the same child violated another rule, the teacher placed a tick beside his or her name. This meant a further three minutes of the next play period was lost. The tallying of lost time could occur for a maximum of nine minutes per each play period. To avoid a child failing to catch a ride home, if required to stay in class for the period ending at 3:00 p.m., that time was carried over to the 10:30 a.m. play period of the next day. This allowed the children time to relax and eat. The researcher stayed with any children who had lost time and supervised them doing teacher-assigned tasks.

Earning Time Back (Fixed)

This procedure was identical to the LT procedure, except that if a child whose name was on the board behaved appropriately for three minutes, that child could earn back lost time. If there were no ticks beside their name, their name would be removed from the board. However, if there were ticks, one tick was removed for each three minutes of appropriate behaviour. If, at the end of any session, the child had not earned all the time back, he or she had to stay in to make up for the balance of the required time. For example, if a child was reprimanded one minute before the end of a session and had only paid back that one minute of time, he or she had to pay back the balance of two minutes in the next recess time.

It was proposed at the beginning of the research that the teacher should not punish or reward children in between experimental phases. However, for reasons of acceptability, and past literature recommendations (See Solanto, 1990), the teachers continued to use the SW contingency in between the three half hour periods.

Earning Time Back (Variable)

This procedure was identical to FEB. However, instead of earning time back occurring after a fixed period of three minutes' appropriate behaviour, this occurred after varying times, which were averaged around five minutes. Effectively, this meant that the children could display good behaviour for a minimum of two minutes and a maximum of eight minutes. The times were calculated by the researcher who averaged them around five minutes. Behaviour had to be appropriate for the calculated length of time before the lost three minutes was earnt back. This

was done to eliminate the practice of some children counting down three minutes and then being disruptive again.

GENERAL PROCEDURE

The basic design of this research was an alternating treatments design (Cooper et al., 1987) whereby the effects of four different approaches to disruption management were randomly alternated and compared.

Experimental Procedures

Baseline

The only class involved for the following stages was Class One. During the baseline phase, the SW system was continued in effect. On the first day of baseline, the teacher reviewed the class rules, and made sure that each child understood them. Class activities ran as normal over this time, with the exception of the presence of the video camera and the researcher. This phase lasted for 9 days.

Alternating Treatments Phase One

Following this, the baseline procedure was continued along with two other procedures, Lose Time (LT) and Fixed Earn Back time (FEB). Each treatment was used in one of the three daily periods, but in a random order. This allowed the researcher to see whether different times of day interfered with the childrens' behaviour. This phase ran for 16 days.

During the alternating treatments phase one, SW, LT and FEB were randomly alternated throughout the daily periods every school day. However, when the researcher was not present, SW was continued. When LT and FEB were in use, only the reinforcement component of SW was used. Each time a different treatment was used, a coloured dot was put on the blackboard to signal to the children which one was in use. A star indicated SW, a blue dot signalled LT, and a red dot meant FEB. No dot was used during the baseline phase. The teacher spoke to the children, explaining what each contingency meant, upon its introduction.

Classroom Two

Alternating Treatments Phase Two

Once disruptive behaviour became consistently lower in Cl1, a baseline was started in Cl2. After this, an alternating treatments phase two began, with the two EB procedures being used in both classrooms, although LT was shown to be as effective in keeping disruptive behaviour low. When these procedures were used, a red dot signalled FEB and a green dot signalled VEB. The LT condition was not used due to reasons of acceptability to the teacher in Cl1 and the children, and instead, the more acceptable EB procedures were used. This allowed for a comparison of which EB treatment was the most efficacious - FEB or VEB. Hence, two half hour sessions were being run in Cl1, and two half hour sessions being run in Cl2 per day. This was done for five days, with the data collection ending due to time constraints (i.e. the school year finished).

Inter-Observer Reliability

Reliability checks of both the researcher's records were made by a second observer frequently, by rating the video tapes. Inter-observer reliability checks were made for one quarter of the total of all sessions. Reliability checks were made for all procedures. This was calculated by dividing the total number of agreements by the total number of agreements plus disagreements. An agreement was scored if both observers recorded a rule violation within the same ten second interval. A disagreement was scored if one observer recorded a violation, while the other did not. Instances where neither observer recorded a violation were not added to the agreements tally in order not to inflate reliability which can occur when behaviours occur at low frequencies (Iwata & Bailey, 1974). Reliability ranged from 79% to 98% (mean 88%).

Treatment Integrity

The consistency of both teachers' use of reprimands was also measured using the videotapes. There was 100% agreement between the two observers that the teachers were reprimanding the children according to the class rules 98% of the time. The same calculation was used as for inter-observer reliability.

Figure One shows the rates of disruption in total for Class One. SW was used for baseline over three sessions. These three sessions were carried on after baseline, with SW, FEB and LT being used. Results of all four phases are show - baseline, alternating treatments one, alternating treatments two and FEB/VEB comparison.

Figure Two shows the rates of disruption for Class Two. SW was used during the baseline phase. Following this, the FEB/VEB comparison is seen. Disruption numbers are totals made by all children, with no individual data being reflected.

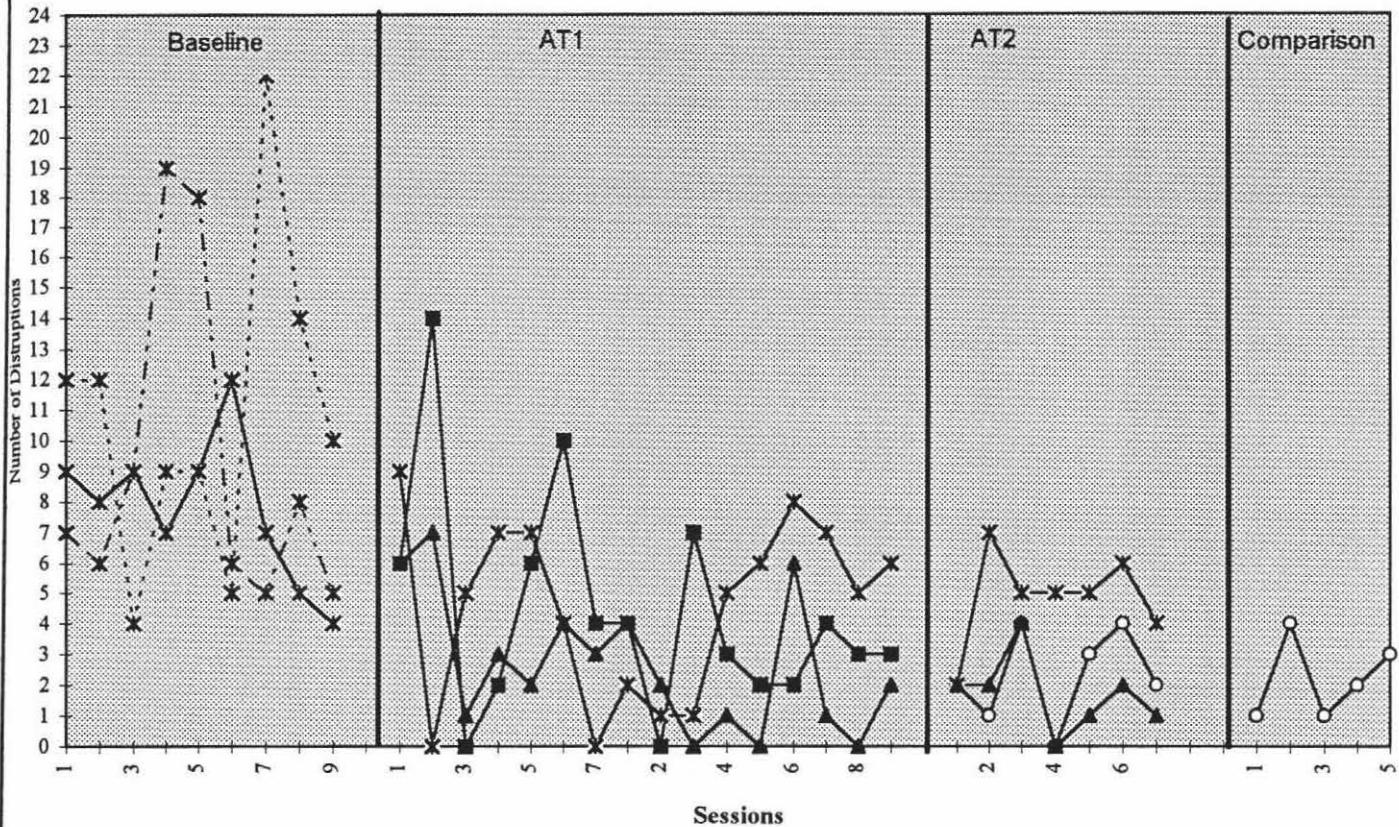


Figure One: Class One Baseline and Treatment Data.

—x— Morning SW —*— Noon SW - - *- Afternoon SW ■— FEB —*— SW —▲— LT —○— VEB

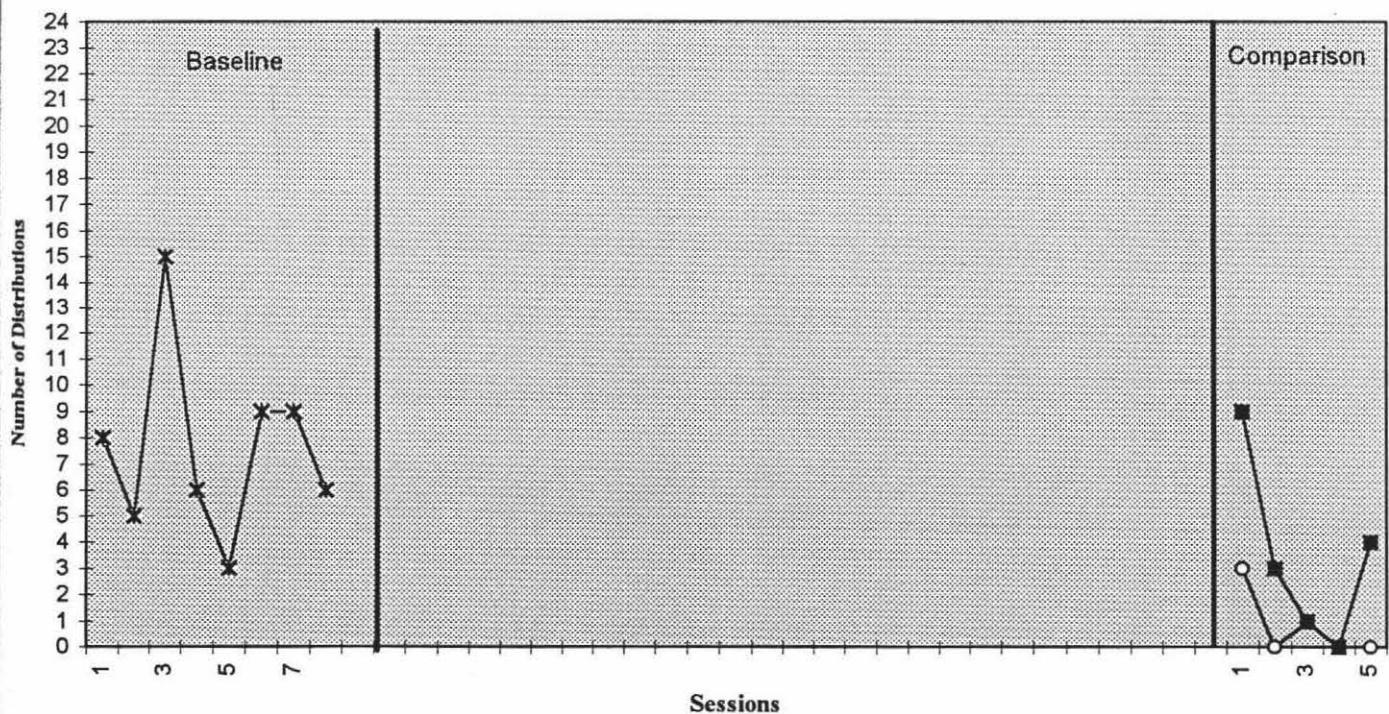


Figure Two: Class Two Baseline and Treatment Data.

—x— Baseline SW —○— VEB ■— FEB

RESULTS

Figure One shows rates of disruption over the course of the study for Class One (Cl1), and Figure Two shows the rates of disruption for Class Two (Cl2), as affected by the different procedures. Each procedure was used once per day in both Figures. The y axis represents rates of disruption, and the x axis shows the days for which disruption was recorded. All data points reflect total disruptions made by all children, and not individuals' data.

Classroom One

During the baseline phase, the rates of disruption in the morning sessions ranged from 4 to 12, (mean 7.4), at noon, disruption ranged from 5 to 19 (mean 9.2), and in the afternoon, disruptive occurrences ranged from 5 to 22 (mean 9.7).

During the alternating treatments phase one, disruptive behaviour is seen to trend down across all procedures, with considerable variability. It is evident however, that disruption is at a lower level with Lose Time (LT), than with other treatments. During the Star of the Week (SW) contingency, disruptions ranged from 0 to 9, (mean 4.6). Disruption reached a high level, then steadily trended down following this. A high level for the next six days was with limited variability. Disruptions under FEB began at six and then rose to a high. Disruption rates fell then trended up gradually over the following three days. Levels of disruptive behaviour then gradually levelled out. The range for this phase was 0 to 14 (mean 3.8). LT shows disruption ranging from 0 to 7 (mean 2.6). Disruption was high at six and seven on the first two days,

then trended down and remained steady. A reversal on day 13 can be seen, with a downward trend in disruption over the final three days of this phase.

An alternating treatments phase two is then seen, where FEB was then replaced with a variable schedule of five minutes. When SW was in use, disruption ranged from 2 to 7, (mean 4.9). While the Variable Earn Back (VEB) procedure was in use, a range of 0 to 4 (mean 2.3). As for LT, disruption ranged from 0 to 4, (mean 1.7). As a consequence of limited time in C11 at this point, data for this phase was collected for seven days, while a baseline in C12 was recorded for eight days.

In the comparison of FEB and VEB phase, the range was 2 to 5, (mean 3.6). The data for C11's FEB were constantly level for the five days. Results of C11's VEB schedule were also constant, however, a little more variable than C11's. These results are slightly lower than those for the FEB procedure. Disruptive behaviour ranged from 1 to 4, (mean 1.8).

Classroom Two

A baseline was run in a second classroom for eight days. Disruptive occurrences ranged from 3 to 15, (mean 6.9). Results of this were with limited variability, with a reversal to 15 on day three. This then trended down but rose again slightly. The baseline measure for this class ended with disruptive behaviour returning to moderate levels.

During the VEB and FEB comparison phase, disruptive behaviour ranged from 1 to 9, (mean 3.4). The FEB contingency in Cl2 shows a peak on day one. This drops steadily, but rises slightly again to three on the final day. The VEB schedule in Cl2 produced lower disruptiveness overall than the FEB procedure, with a range of 0 to 3 (mean 0.8). Disruption stayed level with the use of this technique.

DISCUSSION

Overall, disruption was lower during the alternating treatments phase than it was during the baseline. However, it must be remembered that these effects are in combination with the SW contingency, which was operating also. The most effective procedure for reducing disruptive behaviour was losing time (LT) when compared to Star of the Week (SW) and both Earn Back (EB) procedures. VEB proved to be the most effective in lowering disruptive behaviour in both classes other than LT. Across sessions, a general trend was found whereby disruption decreased under all procedures over all sessions in the alternating treatments and comparison phases of this paper. Although, the SW, FEB and VEB procedures did not manage to keep disruptive behaviour as low as LT overall. This is consistent with the literature (Hall & Kataria, 1992; Kaufman & O'Leary, 1972; Rapport et al., 1982; Shepp & Jensen, 1983) which finds response cost to be a very effective procedure in reducing disruptive behaviour. The following discussion will highlight times that reversals of this trend occurred and give suggestions as to why they may have happened.

Results found for Class One (C11) and Class Two (C12) are comparable. Rates of disruption are slightly higher for C11, although not greatly so. This would not be expected, as C11 had interventions in place for longer, and it would be thought the children would behave more

appropriately as a consequence. It is not possible to draw any firm conclusions as to why this happened.

According to Figure One, not only was LT more effective at reducing disruptive behaviour to a lower level, but it also did so sooner than the other procedures. Disruption trended down soon into the experimental phase. This may be because the children realised what LT meant after two days of seeing the consequences, i.e., if they were disruptive, they lost play time. Disruption was kept fairly constant on day four, with LT and FEB both keeping disruption low. However, only LT kept disruptions low, while they rose to higher levels for both FEB and SW respectively. It can be seen at this point that the effects of LT are beginning to show through the children's less disruptive behaviour at times when this procedure is in place.

During SW, disruptions later trended up. The main complaints from the teacher at this point were that the children were not sitting down and doing as asked. At this time, she was trying to co-ordinate them into playing an indoor game together, so a combination of the procedure being used and the activity being participated in may have contributed to this rise. LT kept disruptiveness low, while it trended up for both for FEB and SW. The effects of LT are clear in Figure One as being a better environment for less disruption in the class. The activities the children were involved in were quite similar during this day, so that cannot account for the discrepancies in behaviour over the periods. The effectiveness of LT is throughout the AT1 phase with disruption consistently staying low, while rates are higher for SW and FEB.

After sixteen days of the AT1, VEB replaced FEB in the AT2 phase. This procedure was not proposed at the outset of the research, but as a result of the childrens' response to FEB, it was seen as necessary for maintaining control. Both the researcher and the teacher noticed that the children were counting down three minutes until their name was rubbed off the board. During this time, the children displayed appropriate behaviour, and once their name was cleared, they became disruptive again. In order to avoid this happening, it was decided that a variation of EB would be used. At this point, instead of the children having to be non-disruptive for three minutes in order to earn their time back, it was not known to them how long they had to display appropriate behaviour for. The researcher calculated the times, averaging five minutes, so the minimum time a child had to display appropriate behaviour for was two minutes with a maximum of eight minutes. This procedure effectively stopped the children from counting down the time required of them to behave appropriately.

The FEB/VEB comparison phase did not run for as long as needed to draw any firm conclusions from. However, the trends on Figure One and Figure Two do indicate that VEB is a more effective contingency for lowering disruptive behaviour than FEB. It is possible that VEB was more effective in lowering disruption rates due to the longer time that the children had to pay back (Burchard & Barrera, 1972) which is harsher in terms of punishment, and also due to the uncertainty about how long it was that they had to display appropriate behaviour for before their name was erased from the board. It is possible to see from the data here that VEB does appear to be more successful than FEB in decreasing disruption.

Time of day made some contribution to disruption levels in this study, and had a slightly better effect on the morning sessions. It is evident from the results that the morning mean is lower than those of the noon and afternoon sessions. This may be because the children have been in class, concentrating for longer periods of time for these two sessions, and that recess and the end of the school day are imminent. The present research did counterbalance the effect of time across all procedures by randomly alternating them equally across all times of day throughout the entire data collection.

However, various factors that were unusual did make a difference to disruption levels, both positively and negatively. These variables included; the type of activities, the teacher and the topic of discussion. Activities that the children were participating in seemed to have an effect on the levels of their disruptive behaviour. For example, on the fourth day of baseline in C11, disruptive occurrences rose to reversed to a high during the noon phase. The children had been outside for physical education, and were having trouble settling down to silent reading when they came inside. Many of the children were talking and giggling. Another example of this is seen on day five of baseline, during the 12 noon period, where disruption was recorded at 18 instances for the session. This may have been high due to the children having to complete maths activities on their own and quietly. Many of their maths periods were typically completed in groups and the children may have been having difficulty adjusting to this change. The presence of a different teacher in the class may also have contributed to more disruptive behaviour at this point. This teacher was a student fulfilling the practical experience component of her course, and was in the class from this point and for the following two weeks.

However, this was the only time when the children were notably disruptive as a result. After this session, they settled down to having the new teacher in their class.

On the afternoon session on day eight of baseline, disruption peaked to a total of 22. At this time, the children were having a story read to them. Another instance of disruption rising is in the afternoon session when, again, a story was being read. Disruptions later reversed to ten. The children were completing language comprehension tasks with music playing at this point in time. The main cause of teacher reprimands at this time was children wandering around the class, not on task and talking.

There was also a rise to seven disruptions later when the teacher was reading a story at this time, which appeared to be an activity where disruptions peaked. This may be due to the fact that disruptive children have difficulty sitting still and keeping attention focused (e.g. Johnson, 1988). Activities such as story telling require the children to sit quietly and to concentrate for long periods of time. These requirements are typically found difficult to follow by disruptive, hyperactive and ADHD children (Hobbs et al., 1980; Landau & Moore, 1991; McGill & Crowther, 1990).

Extraneous variables can also affect disruptive behaviour for the better. Such as the dramatic drop to zero disruptions with SW on day two of the AT1 phase (See Figure One). This may have been due once again to the particular class activity of the time, which was a class discussion lead by the teacher about physical abuse and death. The children found this topic

very interesting and were solemn throughout it, not surprisingly! Another instance of this is evident from day three of the experimental phase, where the children made no disruptions during the morning session. They were involved in science experiments which were very "hands-on" oriented, and the teacher commented that she found they were generally less disruptive during such times. Day seven of the AT1 phase saw constantly low disruption, with a drop for SW to zero. This may be explained by the fact that the children were again doing a "hands-on" task, composing crosswords. On day eight, disruptions were minimal overall, with very active tasks keeping them occupied, such as music.

The ninth day of the AT1 phase shows very low disruptive occurrences. On this day, the children were in the library, where they knew quietness was essential. They also completed language tasks where they were free to "be their own boss". It became clearer over the course of the research that the children enjoyed such activities and they were generally less disruptive as a result. SW and LT kept disruption at a low level on the tenth day. Again, at this time the children were completing active tasks for language projects. The low disruption on day eleven for LT may be due to the fact that a police officer had come to talk to the children about crime and police work, and they were highly engrossed in the discussion. For the other two sessions of that day, the children were mildly disruptive.

Art was an activity which kept disruptiveness low. No disruptions were recorded for the LT period on the following day, as the children were involved in art. Again, this is another "hands-on" activity which the children enjoyed very much and worked well in co-operation with each

other. For the FEB contingency on this day, disruptive instances were low at two. This may be because the children were involved in working in groups, actively involved in the task. Such tasks as those discussed, which are more active, may appeal to children who are more vulnerable to disruption, hyperactivity or ADHD (O'Brien, 1982; Rapport, 1983). It may be that activities which allow them to move around the classroom and be involved physically are more appropriate for such children (Johnson, 1988). There appeared to be no significant interaction between activities and different procedures.

Acceptability To Students And Teachers

Contrary to the literature discussed in the introduction (e.g. Martens et al., 1985; Martens et al., 1986), LT (response cost plus positive reinforcement) was rated as least favourable by both the children and the teachers of both classes. However, the present research did not include the choices that Martens et al (1985) and Martens et al (1986) compared, which were time out, consultation with a specialist or corporal punishment. If compared to these strategies in the present research, LT may have been more acceptable. Upon introduction of the LT and FEB procedures during the experimental phase, the researcher asked the children to raise their hands and vote for the one procedure which they thought they would like the best, LT, FEB or SW. At this time, an equal one third of the class voted for each strategy. The results of this survey were nine for LT, nine for SW and ten for FEB. However, upon completion of the research 16 children said they liked SW the best, seven said they liked FEB the most, and three rated LT as their favourite. VEB was not rated.

It is understandable that the children might accept SW more. This is because with SW, a child had three chances before anything negative happened to him or her for their inappropriate behaviour. The consequences of their disruptive behaviour were delayed until the following day, and at that time, time out with the teacher for three minutes was imposed. One child went so far to say on his fifth warning "I don't care, it's only star of the week!". On the other hand, with both FEB, VEB and LT procedures, the effects of their inappropriate behaviour were felt immediately, more so with the LT strategy than EB where they could regain their lost play time. The results show that the harsher LT technique did in fact reduce disruptive behaviour more than any other procedure.

The teacher of Class One (Cl1) said she found SW to be more favourable for her because she felt that LT was too rigid and stringent to be used with children with no severe behavioural problems. She also thought that moderate levels of disruption were tolerable, and so she did not attempt to completely eliminate it. However, the teacher of Class Two (Cl2) reported that she felt the more immediate punishment given by both the VEB, FEB and LT techniques was more effective in managing uncontrolled behaviour. This was supported by the results. This teacher felt that earn back was appropriate for children who were disruptive as part of typical "childish behaviour". Whereas, LT would be more appropriate for children who are misbehaving frequently and more severely. It may be true that a harsher procedure such as LT is needed with children who have been defined as having one of the Disruptive Behaviour Disorders, such as ADHD.

The children who were the most disruptive were typically the same children. Therefore, even though the results show a total rate of 10 disruptions, who made the disruptions can not be identified. It was often the case that a group of boys were being disruptive and being reprimanded more than other children. Reviewing the tapes showed that a handful of boys who were more frequently disruptive than their peers. Whether two children were responsible for 10 disruptions, or 10 different children were responsible for the disruptions between them can not be stated from these results. For example, on day five of C11's baseline, 18 instances of disruption were recorded, however, only seven children all together made these disturbances between them. If one or two children had been severely disruptive, it may have been pertinent to record individual data, however, this was not deemed necessary. This may be a limitation of this research. However, the aim of this paper was not to pinpoint individuals who were disruptive, but rather to compare behaviour management procedures in their effectiveness for lowering disruptive behaviour.

During the first few days of baseline in both classes, some children acted out in front of the video camera. These instances were not classed as disruption, as the children were still getting used to having the new equipment present. Any such instances however, occurred for the first five days only, and were minimal. At no time did any child have to stay in for the maximum nine minutes. The longest time any child lost was six minutes.

LIMITATIONS

Due to the limited length of time allowed for this study to be run, data collection was not possible for as long as was hoped. This was due to the difficulty in passing such research through the Human Ethics Committee, and the termination of the school year. When using a video camera in research there are considerations, such as the intrusion of privacy, and who the information should be made available to. After much debate, the research was passed through the Committee, but unfortunately, left the researcher with little time left in the school year to gather data. Ideally, the study would have been run over a longer course of time, but this was not possible. Due also to the limited amount of time, no best treatment phase was conducted as is usually the case with this type of research (Cooper et al, 1987). This phase is run in order to demonstrate the effectiveness of the best found treatment when used alone. Unfortunately, due to practical constraints, this was not possible.

Throughout this research, all procedures interacted with the reinforcement component of SW. Aspects of SW still operated throughout because they applied to the end of the week. SW operated outside all sessions other than the two experimental sessions each day. This was done for reasons of acceptability and also because the literature highlights the importance of the use of positive reinforcement with disruptive children (e.g. Gottfredson, 1986). This was a design problem, but was not one over which the experimenter had control. As a result of doing this, aspects of SW were a part of all procedures. Hence, for SW, the children were reinforced for appropriate behaviour and punished for inappropriate behaviour. With LT, the children were punished for inappropriate behaviour through the loss of time, but they could also be rewarded

through the SW system with a tick beside their name for appropriate behaviour. For the FEB and VEB contingencies, the children were able to lose and gain time according to their behaviour, however, they could still earn ticks through SW also. Therefore, SW was rewarding the children throughout the entire study.

Having SW a part of all procedures made multiple treatment interference a problem. Multiple treatment interference is caused by one procedure's effects are working with other procedures that are also being used (Cooper et al., 1987). It is therefore impossible to comment on whether LT, FEB and VEB would have demonstrated better or worse control over disruptive behaviour in the absence of SW. The presence of SW with the other procedures may have affected the results favourably, or unfavourably, it is not possible to say.

It would have been optimal to complete a follow-up period in order to determine the degree to which what was learnt was maintained and generalised (Cooper et al, 1987). However, it is only possible to speculate about the effectiveness of these two factors. Considering delayed reinforcement (Fowler & Baer, 1981), a realistic strategy in which one is rewarded or punished depending on their behaviour (Hogg et al., 1986), the use of teacher praise as a social reinforcer (Bradley & Houghton, 1992), and the requirement of the children to behave appropriately for differing periods of time (Stokes & Baer, 1977) were all used in this study, it would be expected that the children would maintain more appropriate behaviour in class, as was learnt, after the study. The generalisation of skills to other settings should also be strong in the participants in this study, as social reinforcers were used (Bradley & Houghton, 1992),

along with intermittent reinforcement (Koegel & Rincover, 1977) as past literature recommends. It is not possible to comment on the maintenance and generalisation of less disruptive behaviour however, as a follow-up period was not completed.

FUTURE SUGGESTIONS

There are many further possibilities branching from this research. It would be interesting to use the experimental procedures with no background strategy operating, as SW was in this study. This would allow conclusions to be drawn as to which procedure is most efficacious. If this was possible with this paper, definite conclusions could have been drawn as to the effectiveness of LT, and whether VEB was a significantly better technique for lowering disruptive behaviour than FEB.

It would also be interesting for further research to delineate different class activities and to see whether these have a significant impact on disruptive behaviour. Quite possibly, some activities could be detrimental to appropriate classroom behaviour and vice versa. This research gives some indication that activities which encourage moving around the classroom and "hands-on"-type work may be more appropriate for lowering characteristically disruptive childrens' inappropriate behaviour. It is possible that being able to focus their attention on more active tasks reduces concentration difficulties for these children (Johnson, 1988). Enormous benefits would come from such research in terms of classroom management and better facilitation of learning for the disruptive children and those around them.

It may also be salient to use a method such as LT with hyperactive and ADHD children. Both teachers in this study remarked that such a strategy would be helpful for children with severe behavioural problems in the classroom. Such a stringent procedure may also be rated with more acceptance with children who are seriously disruptive. A technique like LT may be seen as being beneficial with such children as it is very structured. Disruptive children may need very rigid boundaries to set their behavioural standards by (Marston, 1994). With children whose behaviour poses a problem for themselves and for those around them, it may be deemed justified and necessary to use a procedure such as LT.

It would also be interesting for future research to investigate the behaviour patterns of maybe three to five children whom the teacher and researcher have identified as being more disruptive than their peers. This research's data show totals of disruption only, and make it impossible to identify particular children who may have caused perhaps the bulk of disruption in the classroom.

Another possibility which branches from this research is the question of whether having to behave appropriately for an unknown period of time deters disruptive behaviour more effectively, as with VEB, when compared to a procedure such as FEB when the time required of the children is known. It would also be interesting to note whether the children behaved more appropriately under VEB because the contingency itself was harsher. In other words,

future research may investigate the components of VEB which make it a more effective procedure than FEB.

CONCLUSIONS

Overall, the greater effectiveness of response cost plus positive reinforcement (LT) was supported by this paper, as was expected. All procedures saw a decline in disruption over the experimental phases. However, neither SW, FEB or VEB managed to keep disruptiveness as low as LT. LT was not rated as acceptably as was expected. Time of day was counterbalanced across all procedures, but the morning was shown to be the time when disruptiveness was lower with SW than with the same procedure at different time of the day. Physically active classroom tasks, such as art, seem to be more effective in reducing disruptive behaviour than activities which involve concentration and complete attention for long periods of time with disruptive or hyperactive children. While activities which require children to sit still and concentrate quietly seem to stem disruptive behaviour. However, limitations, as discussed prevent any firm conclusions from being drawn in these areas. These limitations may be corrected by future research.

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