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# Applications of Implicit Praise in the Classroom

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## **Abstract**

Sharpley (1985) showed that the use of implicit praise for a behaviour that had previously been praised directly would have extinction effects. To replicate this, the order of the praise given (direct or implicit) was varied, with three groups within a classroom of twenty-seven children aged 7-8 years. Results do not support Sharpley (1985); however, a statistically significant increase ( $p < 0.05$ ) in academic performance was produced through the implementation of direct praise. Sharpley's (1985) also predicted that this effect would be observed in classrooms. To further examine this, observations were conducted across classrooms with children of various ages to determine the type of praise used by teachers and the temporal order of this praise. The results show that implicit praise was not typically used for behaviours that had been previously praised directly, and when this order of praise did occur, the results were not negative or extinguishing as Sharpley (1985) argued. The results also show that when implicit praise was used by teachers, it included a description of the behaviour that was being praised. Next the implicit effects of descriptive praise were investigated, with thirty-four children aged 7-8 years across two classrooms. The results suggest that this use of descriptive praise successfully increased the occurrence of a specific novel behaviour in children within close proximity to a target child that was praised for demonstrating that novel behaviour.

Key words: implicit praise, direct praise. Descriptive praise, temporal order, reinforcement.

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In a classroom situation it is often difficult for a teacher to gain compliance from all of the students at once. Teachers may end up spending a lot of time and attention on a few children trying to gain compliance which takes the place of valuable learning time for the rest of the class. The most useful and successful form of teacher attention to gain compliance is contingent praise and rewards (Brodén, Bruce, Mitchell, Carter & Hall, 1970, Hitz & Driscoll, 1989), which can be extremely effective in the acquisition and maintenance of desired behaviours (O’Leary & O’Leary, 1977, Swinson & Harrop, 2001), as well as reducing the occurrence of undesirable behaviours (Roscoe, Fisher, Glover, & Volkert, 2006). The use of praise as a behaviour management tool is especially effective with younger children (Hitz & Driscoll, 1989). Praise is used with younger children to increase compliance behaviours such as hand raising or sitting appropriately (Filcheck, McNeil, & Herschell, 2001). The use of praise has also been shown to increase the on-task behaviour of children (Swinson & Knight, 2007). Swinson and Knight (2007) illustrated that children who are normally disruptive are more on task if the entire class is on task, further reinforcing the use of praise as a whole class behaviour management tool. The majority of research investigating the use of praise focuses on children’s on task behaviour (Harrop & Swinson, 2007) and has shown a positive relationship between children’s on task behaviour and the use of teacher praise (Swinson & Harrop, 2001, Chalk & Bizo, 2004) across all ages (Swinson & Knight, 2007). Praise can also be used to increase a child’s confidence in their academic ability (Chalk & Bizo, 2004) and to encourage them to accurately assess the quality of their own work (Edwards, 2008). In addition there is evidence to suggest that praise may increase academic achievement and test performance (Danner & Lonky, 1981). As well as the above



the majority of children believed that praise was desirable and important for academic and social development (Elwell & Tiberio, 1994).

However, the use of praise is not advocated by all. Some have suggested that praise may lower a child's confidence and cause them to doubt their abilities (Hitz & Driscoll, 1989). For example Edwards (2008), argued that children share a similar past experience of praise, including the notion that it is often delivered immediately before criticism. If children do not believe that their work deserves praise, it will be interpreted as the teacher trying to make them feel better, which in turn decreases the credibility of the source (the teacher) and any future praise that may in fact be genuine and deserved (Edwards, 2008). Edwards' argument seems reasonable. However,, it is possibly a criticism of insincere praise rather than praise itself. This concern is not relevant when praise is given correctly.

It has also been argued that children might become dependent on praise and will not complete work to a high standard without being praised as a result (Hitz & Driscoll, 1989). However, experimental studies have demonstrated that praise does not detrimentally affect a child's intrinsic motivation in this way (Danner & Lonky, 1981). I.e. the child is not only working only to gain praise, but for other benefits as well. It should also be noted that these concerns of praise dependency mentioned above seem unreasonable given that in most settings praise is administered only for skills and behaviours that the child is acquiring, not for those skills and behaviours already in the child's repertoire.

It has been suggested that praise may not be practical as a systematic reinforcer in a large classroom setting (Hitz & Driscoll, 1989) and that when it is used it may be no more effective than other forms of teacher attention (Filcheck et

al., 2001). This argument seems to depend upon a very narrow notion of praise as it is unclear which forms of teacher attention do not involve praise in some form. E.g. teacher interactions and facial gestures are regarded positively by children and are often categorised as non-verbal praise or reinforcement. Also as previously stated by Swinson and Knight (2007) individual children are more likely to be on task when the entire class is on task, thus validating the use of praise in a large group setting.

Some studies have reported doubt regarding the effectiveness of praise for behaviour management with older children (Hitz & Driscoll, 1989). However, there is no evidence in the literature to suggest that the use or effectiveness of praise decreases as children get older (Swinson & Harrop, 2000, 2001, Wheldall, 2005). Children's self reported views of praise have been investigated and no difference was found in the way praise was interpreted or desired by children of various ages (Elwell & Tiberio, 1994). Obviously praise with older children, which is age inappropriate, would not be successful.

Despite these limited criticisms, research in practice has shown praise to be a valuable technique (Swinson & Harrop, 2000, 2001, Wheldall, 2005). It has been clearly demonstrated that praise is more beneficial to a child than criticism, and it is not related to the child's perception of the classroom or their relationship with the teacher (Burnett, 2002). Further-more, increased use of approval in the classroom results in a subsequent decrease in the use of reprimands and criticism (Hayes, Hindle & Withington, 2007, Swinson & Harrop, 2001) and also an increase in teacher confidence (Hayes et al., 2007).

Praise may be used in conjunction with rules to increase desirable behaviour in children. Madsen (1968) systematically introduced behaviour management techniques and found that rules alone had no effect on behaviour, but when praise was also introduced there was a significant decrease in the amount of undesirable behaviour demonstrated by the children (Madsen et al., 1968). Madsen concluded that showing approval of positive behaviour is the key to good behaviour management within the classroom (Madsen et al., 1968). When used in this way praise is effective when given to individual children but it can also be used to modify the behaviour of a group.

Research has shown that people can learn directly from the experience of others through indirect reinforcement (Kazdin, 1973). It has been established that observing other people receiving rewards or punishment has greater influence on the observer than simply seeing how other people behave (Kazdin, 1981). Praise is often directed at a single child (target) when they are demonstrating behaviour that the teacher wishes them to continue in the future (O'Leary & O'Leary, 1977). When used in this way, praise may increase the target child's use of the behaviour that was praised, and also increase the frequency of that behaviour in children in close proximity to the target child, thus demonstrating both the direct and indirect effects of praise (Hitz & Driscoll, 1989).

Research has also shown that children have the ability to evaluate the likelihood of receiving a reward and the reward's perceived worth when observing others' behaviour being reinforced (Sharpley, 1985). They are then able to compare this with their own reward situation (whether they are behaving in a similar manner and so being reinforced, or not) which can lead to behaviour

change in the future, if the child is presented with a similar situation (Sharpley, 1991). The studies outlined above (Kazdin, O'Leary, Hitz & Driscoll, and Sharpley) provide evidence to support the notion of indirect reinforcement, i.e. reinforcing one child within the classroom should have an effect on the behaviour of the other children, even though they are not being directly reinforced.

Research comparing the effects of direct and indirect reinforcement often concludes that direct reinforcement has a greater effect than indirect reinforcement (Sharpley, 1987, Ollendick, Shapiro & Barrett, 1982, Broden et al., 1970, Kern & Clemens, 2007, Kazdin, 1981). Some studies have found virtually no difference between the performance of the children who were directly reinforced and those who were indirectly reinforced (Cheyne, 1972). Further still (Marlatt, 1970) reported that indirect reinforcement was more effective than direct reinforcement. Even when indirect praise has not been shown to be superior, it is still being equivalent to direct praise. Indirect reinforcement is more advantageous in an applied setting as there are more opportunities within a classroom to implement indirect reinforcement than direct reinforcement (Kazdin, 1981).

Indirect reinforcement can be broken down into two subsets; vicarious reinforcement and implicit reinforcement. The definition for each of these subsets is slightly different. Vicarious reinforcement occurs when an observer sees a person getting rewarded for behaviour that they themselves are not currently performing (Kazdin, 1973, Sharpley, 1985 & Ollendick et al., 1982). This acts as a reinforcer to the target (the one being reinforced) and increases the likelihood that they will perform this behaviour in the future. It also affects the future behaviour of the observer (Sharpley, 1985). The term implicit reinforcement was

first coined in 1963 by Lee Sechrest (Sharpley, 1987). It is similar to vicarious reinforcement in that one person out of a pair is reinforced (the target), however, unlike vicarious reinforcement the observer (or peer) is also performing the task without receiving direct reinforcement themselves (Ollendick et al., 1983, Sharpley, 1985 & Sharpley, 1991). So both people within a pair are performing the same task at the same time alongside each other. Each person may be performing at the same level however, only one of the pair will be reinforced. The effects of implicit reinforcement are different from those of vicarious reinforcement because the child not being praised (the peer) is simultaneously being exposed to the observed outcome of praise for the target's performance, as well as the direct consequences of their own performance (Ollendick et al., 1983). Although the target is always explicitly reinforced, the peer can be either implicitly rewarded or punished (Sharpley, 1985). As a result implicit reinforcement can have reinforcing, punishing or extinguishing effects on the peer (Sharpley, 1985).

In vicarious reinforcement it is often assumed that the behaviour change of the observer will be in the same direction as the behaviour change of the target who received the reinforcement (Kazdin, 1973, Flanders 1968). I.e. if the frequency of the target's behaviour increased then so would that of the observer, and vice-versa. This presumption has been supported in lab settings and as a result is often used in applied settings (Kazdin, 1973). Many studies of vicarious reinforcement have been carried out through the use of visual or auditory aids - the observer watches or listens to a tape of a person receiving reinforcement rather than observing the instance first-hand (Kanfer, 1963, Learner & Weiss, 1972). One such study was conducted with university students who wore headphones in

order to hear other students being reinforced for their responses to a simple task (Kanfer, 1963). This vicarious reinforcement resulted in the observers (who heard the reinforcement but were not directly reinforced themselves) significantly increasing their performance on the task.

Two other studies conducted with young children (Bandura, Ross & Ross, 1963 and Learner & Weiss, 1972) also demonstrated the effectiveness of vicarious reinforcement through the use of a short film shown to the observing children. Bandura et al. (1963) demonstrated that children observing another child being punished for exhibiting aggressive behaviour, were less likely to exhibit aggressive behaviour themselves. Also children that observed a child being reinforced for exhibiting aggressive behaviour exhibited significantly more aggressive behaviours in the future when exposed to a similar situation (Bandura et al., 1963). Learner & Weiss (1972) demonstrated that when a child in a film responded positively to a reward they received, the observing children were more likely to exhibit positive behaviour in order to gain a reward than they were if the child in the film responded negatively to their reward.

Some studies disagree with the hypothesis that the observer's behaviour change is always in the same direction as the target's (Ollendick et al., 1983). However, on closer inspection, the studies found in the literature that disagree with this hypothesis do not appear to be investigating vicarious reinforcement. Instead they were unintentionally exploring the similar concept of implicit reinforcement. One such study was conducted with two separate groups of children, one "normal" and one "disturbed" (Ollendick et al., 1982). The study was attempting to illustrate that behaviour change could occur without direct

reinforcement. Children were allocated into pairs and each child was given an individual task, for which only the target child was reinforced. Initial results indicated an increase in the performance of both targets and peers for both groups. However, over time, the peers performance steadily decreased as target performance continued to increase (Ollendick et al., 1982). This is in contrast to the hypothesis of vicarious learning. However, because the peer was also performing the task rather than simply observing the target doing it, the reinforcement was implicit rather than vicarious. Sechrest (1963) found similar results when investigating 'vicarious reinforcement'. Sechrest (1963) conducted a further study and successfully replicated the result that the observing child showed an initial increase in their performance, but this was short lived and their performance soon decreased to below baseline. Sechrest (1963) observed other changes in the peer's behaviour such as an increase in aggressive and negative behaviours, similar to those observed as a result of punishment. These studies do not falsify the vicarious hypothesis, as they were investigating implicit reinforcement rather than vicarious.

After reviewing some of the research on vicarious reinforcement, implicit reinforcement was then examined. As was previously mentioned, the effects of implicit reinforcement can be reinforcing, punishing or extinctive. Sharpley (1985) reviewed twenty-one studies of praise in both typical and atypical classrooms. The majority of these studies were investigating the effects of implicit praise rather than vicarious. Twenty of these studies reported that peer performance replicated target performance (Sharpley, 1985). I.e. when the target increased their appropriate behaviour or decreased their inappropriate behaviour, so did the peer. However, one study (Baker, 1968) did not show any change in

peer performance (Sharpley, 1985). Kazdin (1973) found a similar result when attempting to increase the attentive behaviour of adjacent peers within the classroom. Kazdin showed that when the target received verbal praise for attending, both the target and the peer increased their attending behaviour (Kazdin, 1973). However, when the target was praised for inattentive behaviour, the target's attending behaviour decreased while the peer's attending behaviour continued to increase .

There is a lot of research demonstrating effectiveness of both vicarious and implicit reinforcement for behaviour change. Observer performance under indirect reinforcement is similar to that seen with direct reinforcement (Ollendick, Dailey & Shapiro, 1983). As a result, each of these types of indirect reinforcement (both vicarious and implicit) are often used. The most common uses are to improve pro-social and attentive behaviour, and to decrease disruptive behaviour within the classroom (Ollendick et al., 1983).

Though indirect reinforcement in all its forms is successful, it does have some limitations. In order for indirect reinforcement to work, the observer must not be directly reinforced (Kazdin, 1973). Also, the results of indirect procedures are often smaller in magnitude than those seen with direct reinforcement and are short lived (Kazdin, 1981). There is some evidence to suggest that this indirect reinforcement may not be effective with larger groups (Kazdin, 1981). There are also the problems associated primarily with implicit reinforcement, in that it may be punishing or extinctive. The possible causes of these limitations have been investigated throughout the literature.



Seta (1982) attempted to explain the effect of implicit reinforcement by suggesting that the reinforcement of the target child acts as a discriminative stimulus, or cue, for the peer (as cited by Ollendick et al., 1983). If the peer makes an effort to match the performance of the target then they will also receive reinforcement. This explains the initial increase in performance by the peer (Ollendick et al., 1983). However, after a period of time in which the target is continually reinforced, and the peer is never recognized for their efforts, the peer's performance decreases. The peer may believe that they are being punished and so react in accordance with this belief. This may be linked to the social comparison hypothesis, that one assesses their own skills by comparing their performance to others (Ollendick et al., 1983). This is consistent with Sechrest's (1963) results which found the effects of 'implicit punishment' to be more obvious in boys and older children, who more often adhere to the process of the social comparison hypothesis.

Another possible explanation is that of Bandura (1963) who has suggested that rewards may be perceived as less valuable when they are received implicitly. To test this Sharpley (1983), constructed a hypothetical situation in which children were asked how they would respond to different types of reinforcement (Sharpley, 1987). The results show that all the children in the study would be very happy with a direct reinforcement situation within the classroom. During an implicit reward situation the children indicated that they would be happy if they were the target, but not as happy as in a direct reinforcement situation. There was a significant decrease in the happiness rating when the child being questioned was the peer in the implicit situation. The children also reported that implicit reward situations were unfair, especially if their friend was the target and they were the

peer. However, the children reported that they would continue to work at the same level under all conditions (Sharpley, 1987), which contrasts with the results of previous studies (Ollendick et al., 1982 & Ollendick et al., 1983).

Sharpley (1991a) hypothesised that the effects of implicit reinforcement depended on how an individual rationalised the situation. If the peer believed they were not receiving reinforcement because they were not performing as well as the target, their performance would increase. However, if the peer believed that they were not being reinforced because the person administering the reinforcement was being unfair, they would stop trying and their performance would decrease (Sharpley, 1991a). To test this hypothesis, Sharpley (1991a) designed an experiment with two conditions within an implicit reinforcement situation. During one condition the peers were told that not all the markers had arrived so their work was unable to be marked and they would not be receiving reinforcement. During the other condition no explanation was given. Under the no explanation condition both targets and peers significantly increased from baseline (Sharpley, 1991a). However, under the explanation condition both the targets and peers increased but neither increase was significant. This could be because the peers in the explanation group knew that they would not be receiving reinforcement, where-as the non-explanation group peers may have believed that if they kept trying they would eventually be reinforced (Sharpley, 1991a).

Instead of trying to discover why implicit reinforcement sometimes had a negative effect on peers, one study investigated methods to reduce these negative effects (Sharpley, 1991b). Two strategies were employed: *delay*, in which peers were informed that there was not time to mark their work right now, which

implied that they would be reinforced later, and *exhortation*, in which there was no mention of later scoring, and the examiner simply said “try hard anyway” (Sharpley, 1991b). The results showed that under each of these strategies the peers’ performance increased more than under a typical implicit or control condition. Although the increase in performance was not as large as those seen under a direct reinforcement condition, each strategy appeared to be equally effective at decreasing the negative effects associated with implicit reinforcement (Sharpley, 1991b). Although these strategies were effective at minimising the negative effects of implicit reinforcement, they did not shed any light on the possible reason for the initial negative effects.

Sharpley (1985) conducted three short studies in an attempt to pinpoint why implicit reinforcement sometimes has extinction effects. In the first study it was discovered that participant age and whether the person who administered the reward was known to the participant or not, had no effect. Results also showed that the extinction effects were more powerful within a group than they were in pairs. During the second study it was discovered that in order for implicit reinforcement to be successful, the participants must be allowed to talk amongst themselves. In the third study it was discovered that implicit reinforcement had reinforcing effects if it was received prior to direct-to-all reinforcement. However, if implicit reinforcement was received after direct-to-all reinforcement, extinction effects were observed (Sharpley, 1985).

The finding of study three is consistent with a study attempting to increase the attending behaviour of a pair of boys (Broden et al., 1970). When child ‘A’ was reinforced they increased their attending behaviour and there was also a slight

increase in the attending behaviour of child 'B'. However, during the next phase when child 'B' was reinforced, child 'A's attending decreased and child 'B's attending further increased. This shows that implicit reinforcement received after direct reinforcement fails to maintain the high levels of performance seen during the direct reinforcement phase (Broden et al., 1970). A similar study investigating the order of these two forms of reinforcement was conducted using adult participants (Sharpley, 1988). The implicit before direct phase showed an increase in the performance of both targets and peers from baseline to direct and then again from direct to implicit. Therefore, it does not appear that the extinction effects of implicit reinforcement seen in children continue to occur through adulthood (Sharpley, 1988). However, the time period used was only two days so this may have affected the results.

A further study conducted with kindergarten children shows contrary results to the Sharpley (1988) and Broden et al., (1970) investigations (Weisberg & Clements, 1977). After an implicit reinforcement phase increased the performance of targets and peers (targets showed a larger increase than peers), the entire group was given direct reinforcement intermittently (Weisberg & Clements, 1977). This increased the performance of all children in the group. During the next phase an implicit condition was again introduced, this time with only one target child for the entire group. The high levels of performance achieved under the direct intermittent condition were maintained under this later implicit condition (Weisberg et al., 1977). These results are more likely due to the high resistance to extinction of intermittent reinforcement rather than the order of direct and implicit reinforcement. This assumption is supported by a study which shows that intermittent reinforcement is more effective than direct reinforcement

(Ollendick et al., 1983). Overall, the results of this study do not refute Sharpley's (1985) theory that implicit reinforcement received after direct reinforcement can have extinction effects.

Sharpley's (1985) finding, that the order of reinforcement conditions has an impact on the effects of that reinforcement, has important implications for applied settings. Teachers may be using implicit reinforcement as it is easier and more practical to administer than direct reinforcement, but finding that it is resulting in more disruptive behaviour rather than less. This could be because the teacher is attempting to implicitly reinforce a behaviour that has previously been directly reinforced, and so is resulting in extinction effects. As a result the following study was designed to investigate the effects of the temporal order of implicit and direct praise. This investigation was separated into two parts. The first was an experiment conducted within a single classroom which involved alternating the order in which children received either implicit or direct praise. The second was conducted throughout different classrooms within the school and involved the experimenter observing the teachers' interactions with the students. The experimenter recorded all instances of praise and the implementation order of implicit and direct praise. The experimenter also recorded the children's responses to the teacher's praise. These classroom observations were conducted in order to gain an understanding of the types of reinforcement that were being used within classrooms, and to ensure that the order of these reinforcement types was not having a negative effect.

# **Investigation One**

## Method

### Participants

A class of twenty-seven children from a Hamilton primary school, aged 7 – 8 years, eighteen female and nine male, were randomly assigned to one of three, gender balanced, experimental groups with nine children in each group. Groups Two and Three were further divided with the children being randomly assigned to the role of either target (praise receiver) or peer (praise observer). In the remaining group, Group One, all the participants were assigned to the role of target.

### Procedure

This experiment was conducted three mornings a week in the children's classroom. The experiment was implemented over four phases, the initial phase being Baseline followed by three experimental phases. Baseline and Phases One and Two were conducted over six sessions each, one session per day, while Phase Three was over three sessions, one per day, due to time constraints.

The children were required to complete a task, called 'word study', which was set each day by their teacher. Word study consisted of three or four sentences in which there were spelling and grammatical errors (see examples of word study in appendix two). These sentences were written on the whiteboard at the front of the class where all the children could see them. The children were required to copy these sentences into their books, correcting any mistakes. The possible

corrections that needed to be made included correcting spelling, inserting full stops and capital letters and also speech marks and paragraphs. Once the children had completed this task they handed their books to the researcher for marking and then returned to their desks to continue with the allocated work for that morning.

The marking consisted of a 'tick' for each appropriate correction made and filling in the correct answer where it had been missed by the child. The child's total score was calculated based on the proportion of appropriate corrections they made out of the total number of corrections that needed to be made. This score was combined with the scores of the other children within each experimental group and the mean score was then used for comparison purposes. For fifteen of the twenty-one sessions there were two experimenters present in the classroom. Both of these experimenters marked all the children's work independently and recorded the results. These results were then compared to see how often the experimenters gave each child's work the same score. Inter-observer reliability was then calculated based on the proportion of occurrences that the same score was given, out of the total number of children that completed the task.

All of the children then had their marked work returned to them. The experimenter ensured that while the work was returned, the children were in close proximity to the other children in their treatment group. This enabled all the children within the group to hear the experimenter giving reinforcement. As a reward the target children received verbal praise and a token. This token was part of an ongoing reward system used normally within the classroom. These tokens could be exchanged later for tangible rewards.

In this experiment, reinforcement was given to a child if they improved their score from the previous session or achieved a perfect score i.e. 100%. If a child did not meet the reinforcement criteria the experimenter simply returned their work and said “thank you”. Whether a child was reinforced or not also depended on the experimental phase that was in place and the group they were in. As was previously mentioned this experiment consisted of a baseline and three treatment phases. The table below (Table 1) indicates which intervention each group received during each treatment phase.

	<b>Group One</b>	<b>Group Two</b>	<b>Group Three</b>
<b>Baseline</b>	no intervention	no intervention	no intervention
<b>Phase One</b>	no intervention	implicit praise	direct praise
<b>Phase Two</b>	no intervention	direct praise	implicit praise
<b>Phase Three</b>	direct praise	direct praise	direct praise

Table 1, shows the intervention in place for each treatment group during each phase of the investigation.

When there was no intervention in place the children’s work was returned to them and the experimenter said “thank you”. The children received no praise or other verbal interaction. When the intervention in place was implicit praise the target children in the group were reinforced if they met the previously established criteria i.e. improvement or a perfect score. The peer children within the group were able to hear and observe the target children receiving reinforcement but were not directly reinforced themselves, even if they met reinforcement criteria. When the intervention in place was direct praise all children within the group, both targets and peers, received reinforcement if they met the previously established criteria.

During Baseline, all three experimental groups received no intervention. During Phase One, Group One continued to receive no intervention while Group



Two received implicit praise and Group Three received direct praise. During Phase Two, Group One continued to receive no intervention while the reinforcement criteria of Groups Two and Three were switched. Group Two received direct praise, while Group Three received implicit praise. During Phase Three all three groups received direct praise.

## Results

### Inter-observer agreement

As was previously mentioned there were two experimenters present for fifteen out of the twenty-one sessions. Inter-observer reliability was calculated over those fifteen sessions and agreement ranged from 83%-100%, with a mean of 95%.

### Group One

Group One received no treatment throughout Phases One and Two. During Phase Three Group One received direct reinforcement. There was a statistically significant increase ( $p < 0.05$ ) from Baseline to Phase Three, where the children in Group One received direct reinforcement  $t = 6.78$ ,  $p = .021$ ,  $d = 1.75$ . This result produced a large Cohen's effect size.

### Group Two

Group Two received implicit reinforcement during Phase One and then direct reinforcement during Phase Two. The results indicate that after two phases of treatment there was no statistically significant change ( $p > 0.05$ ) in either target or peer performance from baseline. Phase Three involved the entire class receiving direct reinforcement. The target children of Group Two demonstrated a statistically significant increase ( $p < 0.05$ ) in their scores  $t = 4.9$ ,  $p = .039$ ,  $d = 1.27$ . This result produced a large Cohen's effect size.

### Group Three

Group Three received direct reinforcement during Phase One and implicit reinforcement during Phase Two. The results indicate no statistically significant

changes ( $p > 0.05$ ) in the performance of the targets or peers in Group Three over the entire research period, from Baseline to Phase Three.

## Discussion

Previous studies (Sharpley, 1985 and Broden et al., 1970) have suggested that implicit reinforcement implemented after direct reinforcement has an extinction effect, in which academic performance decreases and inappropriate behaviour increases. These studies showed that the academic performance of peer children decreases significantly with the introduction of implicit reinforcement for a behaviour that has been previously directly reinforced. This finding was not supported by the results of the current investigation. Table 2 contains an overview of the parameters of each of these studies compared with the current study. The number and age of participants involved and the length of the current study was similar to that of Sharpley's (1985). However, the current investigation involved three groups rather than two, to investigate the effects of direct reinforcement alone. Table 3 shows the reported findings of these previous studies compared with the current investigation. It is clear that the increases in academic performance seen in the previous studies were not replicated in the current study. Group Three received implicit reinforcement after direct, and the results show a small Cohen's effect size which was not statistically significant. This lack of noticeable effect is especially noteworthy given that the difficulty of the task was not constant across sessions (see examples in appendix two). After the initial Baseline phase the children sat an English test. Because they did not perform as well as was expected, the teacher simplified Phase One of the following week's word study by removing the speech mark and paragraph components. The effect of the task being made easier during Phase One can be seen in the results of Group One, whose academic performance increased from Baseline, even though they were receiving no intervention. This increase produced only a small Cohen's

effect size and once the task difficulty increased, Group Ones academic performance returned to Baseline. However, in spite of the task being made easier, the children in Group Three did not improve.

<b>Study</b>	<b>Number of participants</b>	<b>Age of participants</b>	<b>Pairs or groups</b>	<b>Length of study</b>
<b>Broden et al., 1970</b>	2 boys	7-8 years	pairs	not reported
<b>Sharpley, 1985 study two</b>	32 children	9-10 years	2 groups	3 phases, 5 trials each
<b>Sharpley, 1985 study three</b>	32 children	9-10 years	2 groups	not reported
<b>Current study</b>	27 children	7-8 years	3 groups	21 sessions

Table 2, compares the parameters of related studies with the current investigation.

<b>Study</b>	<b>Baseline to implicit</b>	<b>Baseline to direct</b>	<b>Implicit before direct</b>	<b>Direct before implicit</b>
<b>Broden et al., 1970</b>	increase in mean 33-58	increase in mean 31-81	increase in mean 58-82	decrease in mean 81-62
<b>Sharpley, 1985 study two</b>	significant increase	significant increase	not reported	significant decrease
<b>Sharpley, 1985 study three</b>	not reported	not reported	increase	significant decrease
<b>Current study</b>	no change	significant increase	no change	no change

Table 3, compares the findings of related studies with the current investigation.

The increase in difficulty during Phase Two (as the speech marks and paragraphs were reinstated) coincided with the implementation of implicit praise to Group Three. This should have exaggerated the extinguishing effects seen with implicit reinforcement, as the children's scores were expected to decrease with the increased difficulty of the task, and the peer children were no longer being reinforced for their efforts so this should also have lowered their scores. However, the expected substantial decrease in academic performance never occurred.

The results of this study support the finding reported in many other studies (Broden et al., 1970, Sharpley, 1987, Ollendick et al., 1982 & Kern et al., 2007) that direct reinforcement significantly increases children's academic performance (see Table 3). This was the only statistically significant finding resulting from the current investigation and can be seen in the results of Group One, who received no intervention until Phase Three, during which direct reinforcement resulted in a statistically significant increase in the group mean. This finding can also be seen with the target children of Group Two, who similarly demonstrated a statistically significant increase in academic performance during Phase Three.

It is interesting to note that direct reinforcement appears to be more effective when implemented with the entire class rather than just one group of children within the class. During Phase Three, when the entire class was reinforced, the children's scores improved more than when their individual groups were reinforced during the previous phases. The increase in performance of all three groups from Baseline to Phase Three produced either a medium or large Cohen's effect size. This may relate to an experiment mentioned in the introduction (Sharpley, 1987), where children said they would be happiest with a direct praise situation to all children within the classroom. The participants in the Sharpley (1987) study believed other reinforcement procedures to be unfair.

Previous studies (Kazdin, 1973, Cheyne, 1972 & Marlatt, 1970) have supported the use of implicit reinforcement to improve children's academic performance. However, the results of this study do not illustrate any change in the children's academic performance through the implementation of implicit praise (see Table 3). Group Two received implicit reinforcement during Phase One, but

did not show any change in academic performance from Baseline. Again the effects of this praise should have been exaggerated by the previously mentioned decrease in difficulty of the task during Phase One. It is unclear why implicit reinforcement had no effect on the academic performance of this group. It is possible that the children were already achieving at a high level and this was maintained by the implicit reinforcement; however, the group average increased during Phase Three when the entire class was reinforced. The results may have had something to do with the group dynamics; one child left the class from this group and another had her desk separated from the rest of the group as she was not working well in a group situation. However, these slight changes to the group's composition should not have had such a large effect on the results. Further investigation into the effects of implicit reinforcement with groups within a classroom situation is required.

The final effect noted in previous studies (Brodén et al., 1970, Sharpley, 1985) is that when implicit reinforcement is followed by direct reinforcement, target children will maintain their high levels of achievement while peer children will demonstrate a further increase to match that of the targets. As illustrated in Table 3 no such effect was seen in the results of this study. The implementation of direct reinforcement following implicit reinforcement in Group Two had no effect on the academic performance of either the target or peer children within this group. It is possible that the peer children of Group Two were already achieving at a high level and were not able to improve from this, so the implementation of implicit reinforcement was successful at maintaining this high achievement.

Overall, the results show that implicit praise failed to increase academic performance to a statistically significant level. Also, there is no evidence to suggest that implicit praise implemented after direct reinforcement has an extinguishing effect. Alternatively, the results suggest that implicit praise is successful at maintaining the high levels of performance achieved through direct reinforcement.

A possible concern in this situation could be control over the children copying each other's work. One solution to this would be to separate their desks so each child is sitting alone. However, this would remove opportunities for free talk within the classroom, which has previously been established as necessary for the success of implicit praise. The previously mentioned lack of control over task difficulty was also a problem in this study. The difficulty level of the task was decreased as a result of low test scores, but after a week the difficulty was again raised and would continue to increase as the school term progressed. The results may have been affected by the increase in difficulty of the task; however, this type of increase in difficulty is common in applied classroom settings as there is a need for teachers to keep in line with the curriculum. Also, the task may not have been appropriate for this investigation due to its lack of consistency. The children were not required to correct a fixed number of mistakes each session e.g. each day's task did not contain six spelling and four full stops and capital letters that needed to be corrected. The number and type of corrections that needed to be made varied from day to day. This is typical of a classroom situation, but not ideal for a research situation. Perhaps future research on this topic should be conducted using a task that has a constant difficulty level, such as children's learning of their times



tables. The score could be measured as a proportion of correct equations out of a constant possible total, e.g. two, three, four and five times tables.

One last factor that needs to be taken into account is the type of reinforcer used. The results of this study may have been affected by the perceived worth of the reinforcer. The experimenter made use of an existing reinforcement system in the classroom, which may not have been as highly valued by the children as an alternative reinforcer. Perhaps academic tasks that children are struggling with should be given powerful reinforcers other than those used within the class for appropriate behaviour. The reinforcer and the task it is received for could be customised to suit individual children and be included in their Individual Education Plans.

As previously stated, research has shown that direct praise can increase children's academic performance. This finding was supported in the current investigation where children's scores on a literary task increased when direct reinforcement was introduced. However, direct reinforcement is not practical for use within an applied classroom setting. As a result, the effects of indirect reinforcement techniques, such as implicit praise, have been investigated. Previous research has shown that these techniques are effective at increasing academic performance but not to the extent of direct reinforcement. However, the academic performance of the children within this study failed to increase to a statistically significant level through the use of implicit praise. Finally, Sharpley (1985) suggested that applying implicit reinforcement after direct reinforcement would have an extinction effect. Again the results of the current investigation do not support this finding. The academic performance of the children in this study

did not decrease as a result of implicit reinforcement being implemented after direct reinforcement. Rather, the results show that implicit reinforcement was successful at maintaining the high levels of academic achievement that resulted from direct reinforcement.

It is difficult to compare the current investigation with that of Sharpley's (1985) as specific details were not reported e.g. the length of the study. The number of trials is mentioned but it is unclear whether the trials are all conducted on the same day or over a series of sessions. Also Sharpley (1985) reports significant changes in performance but does not mention the effect size or the results of any other statistical analyses. Further research may be required in this area to determine whether the implementation of implicit praise after direct praise does have an effect. Overall the results of the current investigation suggest that direct reinforcement is successful at increasing academic performance and should not be replaced with indirect reinforcement techniques that may have no effect.

## **Classroom observation**

Sharpley (1985) suggested that implicit praise received for a behaviour that had previously been praised directly would have an extinction effect. As part of his discussion he mentioned the possibility of conducting classroom observations to record whether teachers were making the mistake of using implicit praise after direct praise. A review of the literature revealed that classroom observations to investigate praise had been previously conducted, but none of these investigated the order of different types of praise. The second aspect of the current investigation involved observations across various classrooms within the school, as Sharpley (1985) suggested.

Previous observations discovered that the use of praise in the regular classroom was low (Hattie & Timberley, 2007). Studies reviewing the use of praise and feedback have uncovered some different trends over the past 40 years. In the 1970's the rates of teacher disapproval were much higher than the rates of approval (Harrop & Swinson, 2000, Chalk and Bizo, 2004). In the 1980's this trend switched and teachers were documented to be using higher rates of approval than disapproval (Harrop & Swinson, 2000, Chalk & Bizo, 2004). Research also shows that praise is given more for academic achievements than for behaviour (Chalk & Bizo, 2004) and that reprimands are used much more as a behaviour management technique (Harrop & Swinson, 2000, Hayes et al., 2007). Observations over a variety of age groups revealed that teachers used praise for academic performance, three to four times more than disapproval; however, praise for behaviour was rarely observed (Wheldall, 2005). The same observations show that teachers showed disapproval for behaviour three to five times more than

approval (Wheldall, 2005). The rates of praise and feedback for academic performance were higher for disruptive children; however, the rates of reprimands for behaviour were also higher for this group (Swinson & Knight, 2007).

The results of questionnaires completed by teachers in a previous study suggest that most teachers know about the importance of using praise and rewards, and that most believe that they are doing so in their classrooms (Wheldall, 2005). However, despite the large amount of research demonstrating the effectiveness of contingent praise as a reinforcer, there is a lack of evidence to suggest its actual use in the regular classroom (Wheldall, 2005). When praise is used by the teacher in the classroom it is more often directed at individual children than groups of children (Harrop & Swinson, 2000), and results show that the majority of this feedback was in reaction to behaviour and was often negative (Chalk & Bizo, 2004). Also, although praise is used somewhat by teachers, it is unlikely that this praise is functioning as a reinforcer because the frequency of the praise is too low and is often not contingent (Chalk & Bizo, 2004, Brophy, 1981b). The way in which praise is delivered, such as for tasks that are easy, results in the source, the teacher, not being regarded as credible (Brophy, 1981b). Of the total instances of praise observed, only about 5% specifies the behaviour that is being reinforced. This low rate may be due to the children's knowledge of the rules, which results in them often knowing what they are being praised for without having to be specifically told (Brophy, 1981a).

Observations have shown that praise is often given without a description of the behaviour that is being praised; whereas statements of disapproval include a description more often (Harrop & Swinson, 2000). The increased use of

specificity or the inclusion of a description of the behaviour delivered with the praise would make the child aware of the rules that are in place, and that following these rules will result in positive praise. This combination of rules and consequences will function better as a discriminative stimulus for the child's future behaviour.

Previous observations have focused on the rate of praise used in classrooms. The present research focused on the type of praise that was administered. The researcher recorded whether the praise was direct or indirect, if it was administered to an individual or a group and if it included a description of the behaviour that was being praised. The procedure and results of these observations are outlined in the next sections.

## Method

During the current investigation, the researcher conducted observations of the teachers across five of the fifteen classrooms within Hamilton East School in which the experiment was taking place. The children within the classes ranged from 5 - 9 years in age and each observation period was half an hour long.

A data sheet was used to record all instances of praise within the classroom. Aspects of the praise that were recorded were: whether the praise was directed at a group or an individual, whether it was descriptive or not and whether it was direct or implicit. Other relevant observations were also recorded such as any reinforcement procedures in place within the classroom.

The researcher did not interact with the children or the teachers in any way during the observations. The researcher sat in an area out of the way where they could hear all of the teacher's interactions with the children.

## Results

Over the two and a half hours of observation (across the five classrooms) the researcher noted a total of ninety-nine instances of praise, either direct or indirect. Of these ninety-nine occurrences there were two instances of implicit praise being used after direct praise.

In total there were thirty-eight instances of implicit reinforcement and sixty-one of direct. Of the sixty-one instances of direct praise, seventeen were implemented to the whole group, while forty-four were to individual children. All thirty-eight instances of implicit praise were implemented to individual children. Out of the ninety-nine total instances of praise, only seventeen were implemented to the group of children as a whole.

Of the ninety-nine instances of praise, sixty-three were descriptive (the praise included a description of the behaviour that was being praised), while thirty-six were not. Examples of non-descriptive praise include “good” and “well done”. Of the seventeen instances of praise directed to the whole group, fourteen were descriptive. Of the ninety-nine total instances of praise recorded, sixty-three were implemented for positive behaviour while thirty-six were for academic achievement.

Each of the five classrooms made use of a school wide reward system that was in place. Two of the five classrooms had additional reward procedures in place.

## Discussion

With regards to the order of different types of praise used within the classroom the results show two instances of implicit praise being used after direct praise. The results of casual observations show that the first instance of implicit praise after the direct praise did not appear to have any negative effects within the classroom. The children took note of the implicit praise and began to demonstrate the behaviours e.g. filling up the page, which the target child had been praised for. The use of implicit praise following direct praise was not successful in the second instance. The teacher used a combination of direct and implicit praise to gain class attention but was not successful in her attempts. The children within this class were older than the children in the other classes that were observed. This may have contributed to the lack of compliance. Also the effects of the experimenter being present must be taken into account. The children may have been behaving differently as a result and also, the teacher may have been trying to use praise instead of reprimand while the experimenter was present.

Overall the use of implicit praise following direct praise was not common practice amongst the teachers observed. Implicit praise was used by the teachers in all of the classrooms that were observed but not as often as direct praise (thirty-eight instances of implicit, sixty-one instances of direct). This implicit praise was given for aspects of academic work that other children in the class could benefit from, or to increase attending behaviour and instruction following. Every instance of implicit praise was descriptive and given to an individual child. This resulted in all of the other children in the class knowing what they needed to do in order to gain reinforcement. In all instances, with the exception of the single instance



previously mentioned, this implicit praise was successful at achieving the teacher's desired result. Often after implicit praise was used to gain a desired behaviour, all the children within the class were praised for that behaviour, i.e. if an individual was implicitly praised for following instructions when the rest of the children were failing to do so, once the other children demonstrated that they too were following the instruction the teacher praised the entire group.

The majority (72%) of the direct praise that the researcher observed was to individuals for academic achievements such as answering a question or offering an idea. This finding supports the results of previous studies that direct praise is more often given to individuals, and when this praise is given it is more often for academic achievements than for behaviour (chalk & Bizo, 2004, Harrop & Swinson, 2000). On some occasions (28%), all of the children, or a group of children within the classroom were directly praised. This direct praise was often (82%) for an aspect of their behaviour. Every time the group was praised directly for behaviour, the praise was descriptive. This description was not included when the group praise was implemented for academic achievement.

Of the ninety nine total instances of praise that were observed over the observation period, almost two-thirds were descriptive (64%). That is, the verbal praise that was given included a description of the behaviour that was being praised. The majority of instances of this descriptive praise were implemented for positive behaviour, usually to individual children (78%). Thirty six of the ninety nine instances of praise observed were non-descriptive. These were comprised of one or two word statements, such as "good" or "well done". Every instance of non-descriptive praise was implemented for academic achievement, usually to

individual children (92%). The teachers appeared to use descriptive praise when reinforcing behaviour, but not when reinforcing academic achievement. This may be because the children know what is expected of them academically and realise what the praise is for without having to be explicitly informed through descriptive praise. Or more likely when a description is included in the praise it is for the benefit of the children in close proximity to the teacher and the target child, rather than the individual child being praised. In which case, academic praise is often implemented to individual children and is not something that the other children in the class would benefit from hearing, so a description is not required.

The school as a whole has a token system in place where-by the children are given cards by their teachers which are then put into a draw to win prizes at assembly. Of the five classes observed three did not have any other token system in place. In the classes that did not have an additional token system the teachers employed other methods of reinforcement. In one class, the children who were behaving well were chosen to help the teacher with small jobs. In another class, the children who produced good writing were allowed to display their writing book on a special stand for other children and parents to see. These subtler forms of reward appeared to work well in these classes through increasing compliance and encouraging the children to try hard to produce work of a high standard.

One of the two classes that did have an additional token system was using this system for only one child within the classroom. This child demonstrated a lot of non-compliance during the observation period and the token system did not appear to be having any effect. The other class had a chart on which the children received ticks. Once they had a certain number of ticks they received a reward

such as free computer time. These ticks were administered at a time when all the children were sitting together on the mat. The two classes with an additional token system in place contained the oldest children of all the classes observed. It is possible that as children get older they require more obvious rewards that are available for them to physically see, in order for the reward to be effective.

The two classes that had a separate token system also used punishment techniques. In one class the teacher used verbal reprimands and separated the children who were not behaving well. In the other class the teacher employed a system where children who were not behaving had their name written on the board. Additional instances of misbehavior resulted in a tick next to their name. All the children with their name on the board received later consequences such as staying in class at lunch time. As previously mentioned, these two classes contained the oldest of the children observed. The teachers of these older children may have discovered that using positive reinforcement in conjunction with negative consequences is more effective than using positive reinforcement alone.

Overall, praise was widely used within the observed classrooms, direct praise more often than implicit. Implicit praise was typically used to gain class compliance and then followed by direct praise to the whole group. The use of implicit praise for behaviour appeared to be successful within all of the classrooms observed. This implicit praise was also successful when used to highlight aspects of a task that all children could benefit from knowing about. One of the two occasions, when implicit praise was administered after direct praise, resulted in less compliance than there had been before any praise was given. This is not evidence enough to suggest a strong effect, but perhaps future research

would be helpful. Descriptive praise was used more often than non-descriptive praise and was often for aspects of positive behaviour. Praise for academic achievements was direct and non-descriptive, and most often given to individual children.

After reviewing the findings of the classroom observations, it became apparent that on the occasions in which implicit praise was used by the teachers it included a description of the behaviour that was being reinforced. The praise given to the children in Investigation One did not include such a description. The ineffectiveness of implicit reinforcement that was apparent in Investigation One may be the result of this lack of descriptive praise. It is unclear whether the Sharpley (1985) study used descriptive praise when reinforcing the participants, as specific aspects of the praise were not reported. If Sharpley (1985) did use descriptive praise in his study, this may explain why the findings of Investigation One differed from that of Sharpley's. As a result, the use and effectiveness of descriptive praise were examined.

Research has demonstrated that in order for praise to be successful it should be made up of two main components, delivery of a potential reinforcer and information regarding the correct response (Roscoe, Fisher, Glover & Volkert, 2006, Brophy, 1981a, Chalk & Bizo, 2004). Praise that includes a description of the behaviour that is being reinforced has been referred to as both descriptive praise and specific praise. Descriptive praise has been proven to be more effective than praise that does not include a description of the behaviour (Chalk & Bizo, 2004). When information is given during praise, it helps the student to understand exactly which aspect of their behaviour is appropriate and gives them more control over their learning (Chalk & Bizo, 2004). This information indicates to the child how they should respond in the future to achieve better results (Roscoe et al., 2006). Studies have shown that instructions alone can modify a person's behaviour; however, the results are not long lasting without that behaviour being

reinforced (Drabman & Lahey, 1974). The use of praise in conjunction with instructions may provide the reinforcer required for long lasting results. Both non-specific and specific praise have been shown to increase the on task-behaviour of children within a classroom. However, while the effects of non-specific praise reached a plateau, specific praise continued to have an increasing effect (Chalk & Bizo, 2004). Parent Child Interaction Therapy (PCIT) advocates the use of description or labeling during praise, as it allows for the child to know exactly what they are being praised for (Filcheck et al., 2001), which further advocates the use of descriptive praise. The results of observations of superior teachers showed that they do not use praise any more than regular teachers; however, when they do use praise it includes a description (Amidon & Giammatteo, 1965).

Non-specific praise may not be as successful (as specific praise), as it is thought to place a judgment on the child's ability and give an indication of their status as viewed by the teacher (Hitz & Driscoll, 1989). That is, the child being praised might not realise the praise is for a specific behaviour, but rather think that the teacher is just being nice. This may impact the children within close proximity who hear the praise but do not receive praise themselves; the observing child may believe that the teacher doesn't like them or think they are not as good as the child who received praise. It is also noted that non-specific praise, which does not contain any information, may be viewed by young children as a moralistic statement rather than a positive evaluation of their effort (Dennis, 1957). This is a problem as the praise would not be serving the intended purpose of increasing the occurrence of positive behaviour or academic performance. Instead, praise may be viewed as something given to children whom the teacher likes, and is out of reach of other children regardless of their actions.

The lack of description included in the praise during Investigation One may have resulted in the children not realising which aspect of their behaviour was being praised. The peer children in Investigation One observed the target children receiving verbal praise when their work was returned, but may not have been aware that this praise was for an improvement in academic achievement. Instead the peer children may have felt that the researcher did not value their work. This could have had negative consequences for the peer children and resulted in them not putting as much effort into their work. Because of this finding the researcher conducted a further investigation across two of the classes within the school. Investigation Two involved working with small groups within the classrooms while administering descriptive praise. The researcher observed the effects that this praise had on the child that received the praise, as well as the other children within the group. The researcher investigated the effects of implicit descriptive praise across three different scenarios; Study One using pre-existing behaviours, Study Two using novel behaviours that only one child within the group was aware of, and Study Three using novel behaviours that were stated as a rule to the entire group.

During Study One, conducted over two sessions, the researcher divided each session into ten second intervals. A target behaviour was chosen and the number of children demonstrating that behaviour during each ten second interval was recorded. The researcher used descriptive praise throughout the first half of the session and then did not praise at all throughout the second half. Every occurrence of praise was also recorded.

Study two was conducted over five sessions, in which novel behaviours were selected as target behaviours. These novel behaviours included; raising two hands rather than one, putting your hands on your head or nose to indicate you have finished, and following reading with two fingers or with your pinky finger. One target child in each group was selected prior to the session and asked to demonstrate the target behaviour when the opportunity arose. The other children in the group were unaware of the target behaviour. The target child was descriptively praised when they demonstrated the behaviour. If other children demonstrated the behaviour, they also received praise. The number of children who demonstrated the behaviour at each opportunity was recorded as a percentage of the total number of children in the group. Every occurrence of praise was also recorded.

Similar novel behaviours were again used during Study Three, conducted over seven sessions. However, this time the novel behaviour was stated as a rule to the whole group at the start of the session, e.g. “today instead of putting up one hand to answer a question, I want you to put up two hands”. This was in contrast to the previous phase where only one child was aware of the novel behaviour. Once again the researcher administered descriptive praise to specific children on some of the occasions in which they demonstrated the behaviour. Every occurrence of praise was recorded along with the percentage of children who demonstrated the target behaviour at each opportunity.



## **Investigation Two**

### Method

#### Participants

The children were twenty six girls and eight boys across two classes at a Hamilton primary school. All of the children were 7-8 years old at the time the experiment was conducted. The same children were used for all three studies within Investigation Two. The researcher made use of pre-existing groups within the classroom, i.e. their assigned reading or maths group, for this experiment.

#### Procedure

The researcher worked directly with each group and filled the role of a teacher aid. An observer was also present during all of the experimental conditions. The observer sometimes interacted directly with one or more of the children in the group. This occurred when a child required help with the task they were working on. This interaction did not interfere with the experiment or data collection in any way.

Investigation Two was conducted with children from two separate classrooms within the school. Each class participated two afternoons a week for approximately half an hour per session. The researcher worked solely with one group within the classroom. In Room One the children were separated into their reading groups, containing three to eight children in each. In Room Two the children were separated into their maths groups, which also ranged from three to eight children in size. In each class the group working with the researcher was

slightly separated from the rest of the class to minimise the disruption to all parties. The researcher guided the children within the group through an activity that was set by the teacher. The researcher acted as a teacher aid to assist the students and their teacher as much as possible.

## Results

The results of all three studies were graphed to illustrate the proportion of children demonstrating the target behaviour. Every occurrence of descriptive praise is also illustrated in the graphs through the use of vertical lines. During Study One the proportion of children demonstrating the behaviour is illustrated for every ten second period, where-as during Studies Two and Three, the proportion of children is illustrated for every opportunity the children had to demonstrate the target behaviour. An opportunity was defined prior to the session; however, this definition may have varied depending on the behaviour. For example, an opportunity for the behaviour 'put your hands on your head when finished' was every time a child finished a problem they were working on or a section of the story they had been asked to read. An opportunity to demonstrate the behaviour 'follow with your pinky finger' occurred whenever the group was reading together and each opportunity was separated by a pause in reading, usually due to the researcher asking a question about the story.

Some of the graphs show that the proportion of children demonstrating the target behaviour increased on the same opportunity as praise was administered (Figures 5 and 6). However, other graphs show that the proportion of children demonstrating the target behaviour increased at the opportunity directly after the one in which praise was administered (Figures 3 and 8). The reason for this is due to which child within the group was praised at that opportunity; if the first child to demonstrate the behaviour was praised then all of the other children within the group still had the chance to demonstrate the behaviour within that opportunity. However, if the last child was praised it meant the other children within the group

had already failed to demonstrate the behaviour at that opportunity, and so did not have another chance to do so until the following opportunity. For example, if the target behaviour is 'putting your hands on your head when you have finished reading a paragraph', and the first child to finish reading puts their hands on their head and is descriptively praised for doing so, the other children within the group will hear the praise and thus have the opportunity to demonstrate this behaviour when they finish reading. However, if the only child to put their hands on their head is the last child to finish reading and s/he is praised for doing so, the opportunity for the other children within the group to demonstrate this behaviour has passed, as they have already finished reading before this event. The children would then have to wait for the following opportunity to demonstrate the behaviour and receive the resultant praise.

### Study One

Across both sessions the rate of the behaviour is high (Figure 1 and Figure 2). The graphs show that the proportion of children demonstrating the target behaviour does not appear to be affected by the introduction of descriptive praise (indicated on the graphs by the vertical lines). The graphs also show that the proportion of children demonstrating the target behaviour remained high throughout the session, even when praise was no longer being administered.

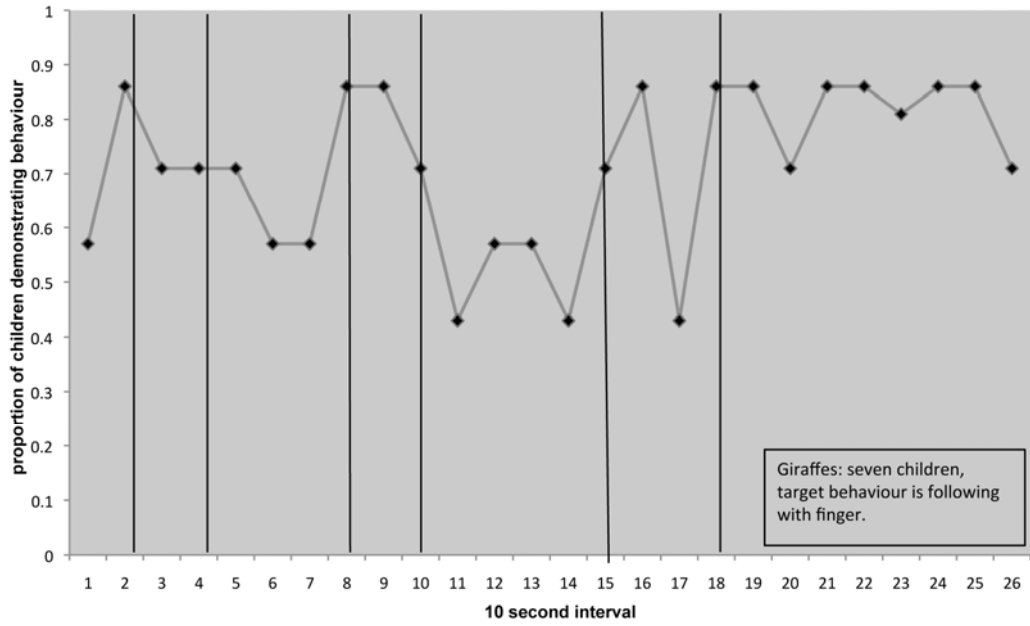


Figure 1 shows the proportion of children demonstrating the target behaviour of following with your finger during ten second intervals within an observation period.

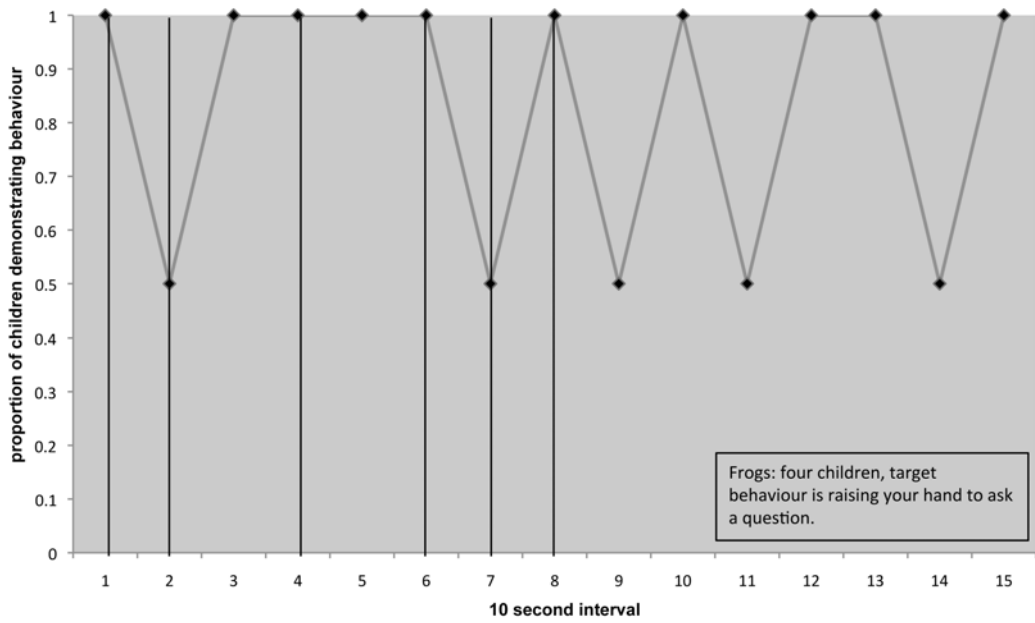


Figure 2 shows the proportion of children demonstrating the target behaviour of raising your hand to answer a question during ten second intervals within an observation period.

## Study Two

Figure 3 illustrates that praise was administered to the target child on the first opportunity to demonstrate the behaviour. The percentage of children demonstrating the behaviour on the following opportunity (opportunity 2) increased from 25% to 75%. Figure 6 illustrates that praise was given at opportunities eight and ten. During these same opportunities the percentage of children demonstrating the target behaviour increased. Demonstration of the behaviour increased from 0 to 20% during opportunity eight and from 20% to 60% during opportunity ten.

During two of the sessions, the researcher stopped administering praise towards the end of the session while there were still a few opportunities to demonstrate the behaviour. During one of these sessions there was a peak in the percentage of children demonstrating the behaviour even though no praise was being administered (Figure 5). This trend was not seen in Figure 6, where once the praise was no longer administered, the percentage of children demonstrating the behaviour dropped to zero.

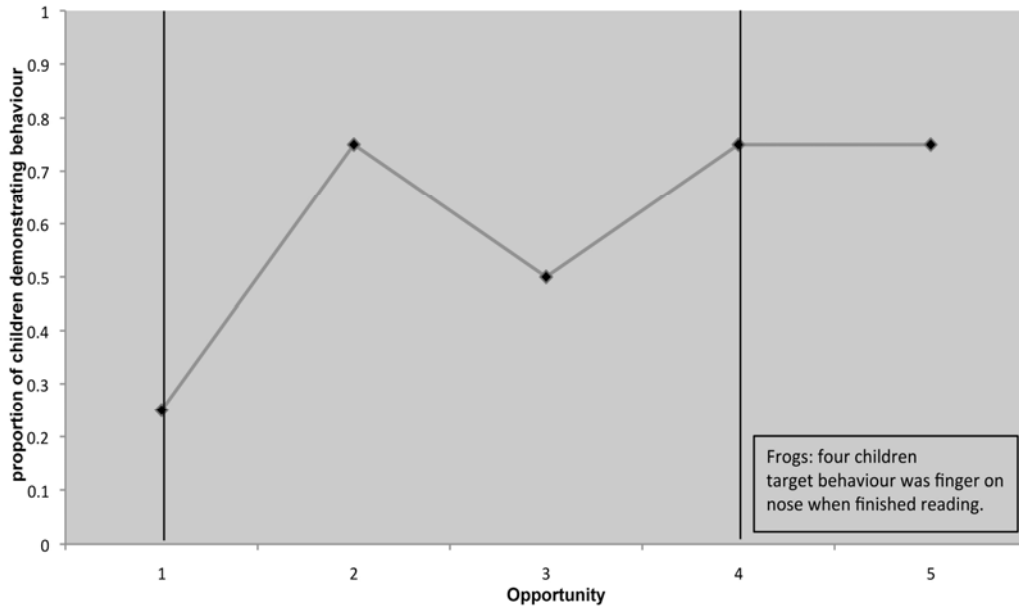


Figure 3 shows the proportion of children demonstrating the target behaviour of putting your finger on your nose when finished reading at every opportunity.

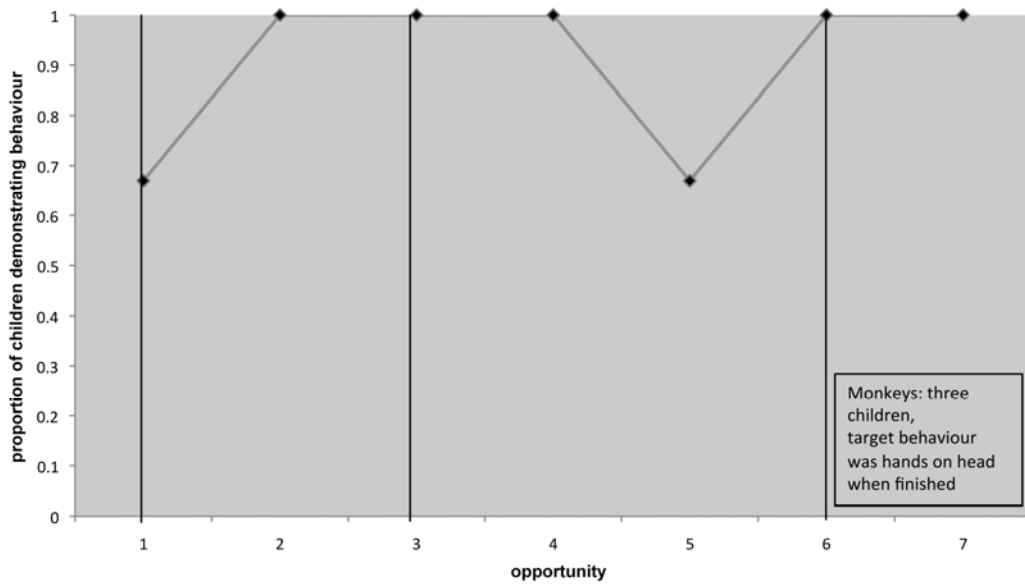


Figure 4 shows the proportion of children demonstrating the target behaviour of putting your hands on your head when you have finished reading at every opportunity.

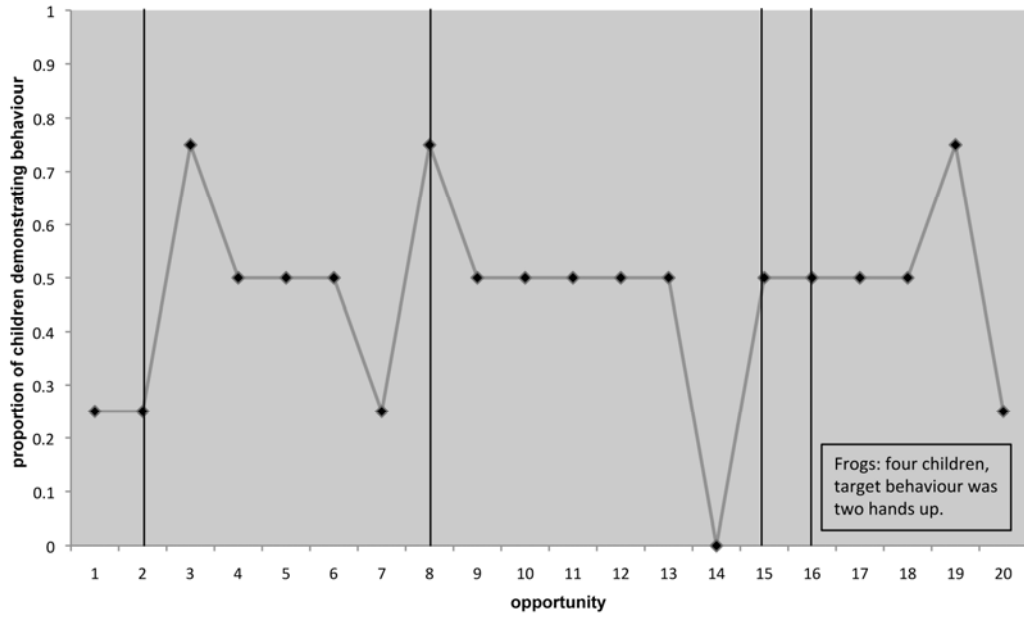


Figure 5. shows the proportion of children demonstrating the target behaviour of raising two hands to answer a question at every opportunity.

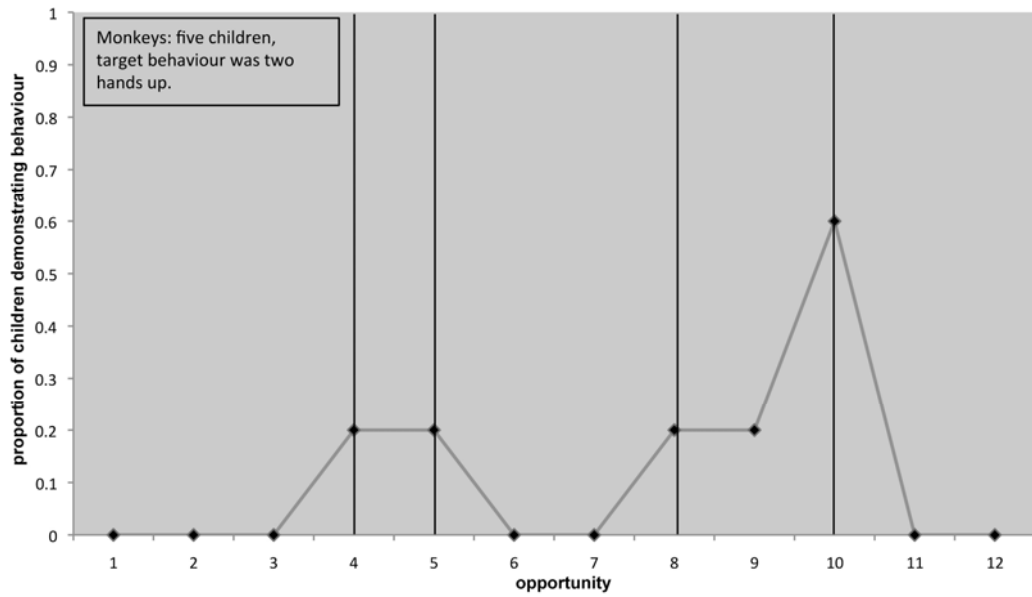


Figure 6. shows the proportion of children demonstrating the target behaviour of raising two hands to answer a question at every opportunity.



### Study Three

On most occasions the percentage of children demonstrating the behaviour increased with the opportunity that was praised or the opportunity directly after (Figure 7 and Figure 8). Figure 7 illustrates a large increase from 0 to 60% the first time that praise was administered, which was the third opportunity that the children had to demonstrate the behaviour.

Figure 8 illustrates that initially the children demonstrated the behaviour (80%), but demonstration decreased when praise was not given immediately at the first opportunity (10%). When praise was administered at the second opportunity the proportion of children demonstrating the behaviour again increased.

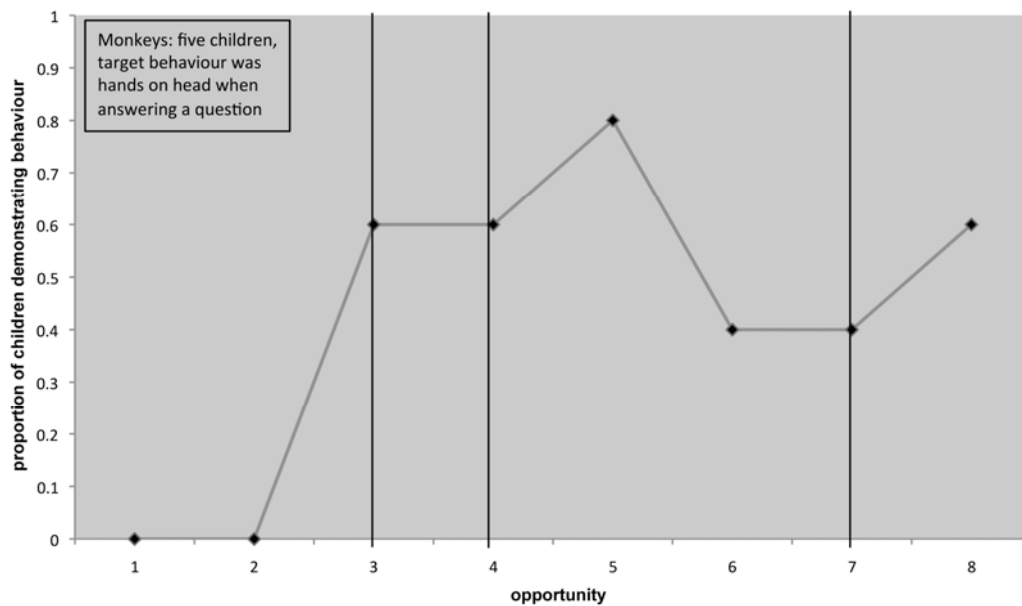


Figure 7, shows the proportion of children demonstrating the target behaviour of putting your hands on your head to answer a question at every opportunity.

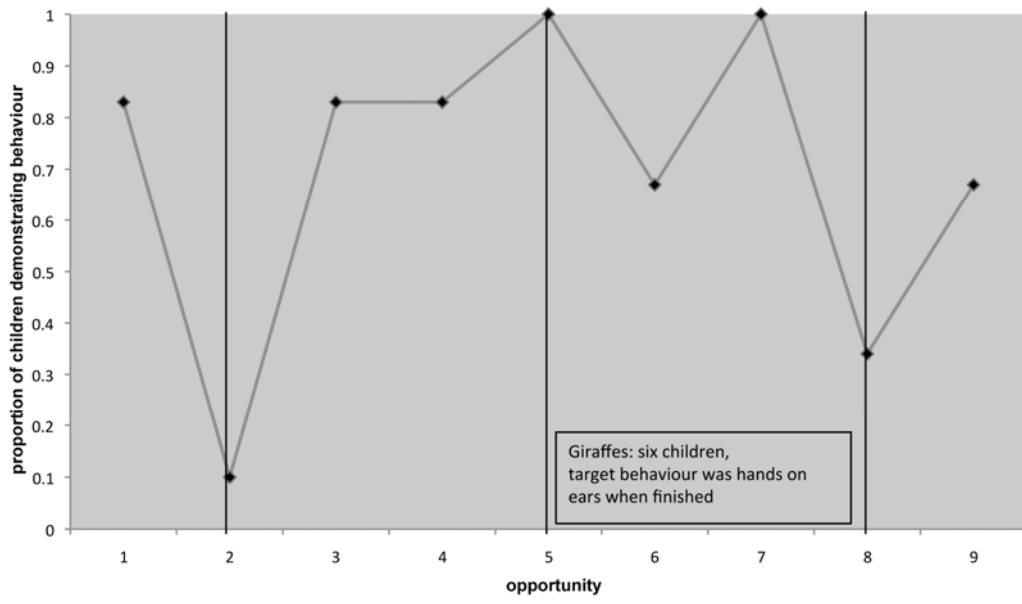


Figure 8. shows the proportion of children demonstrating the target behaviour of putting your hands on your ears when finished reading at every opportunity.

## Discussion

During Study One, the researcher praised for the first part of the session and then withheld praise for the second part of the session. The graphs illustrate that the proportion of children demonstrating the target behaviour did not decrease after the praise was withheld. This may have been due to the history of reinforcement surrounding the target behaviours chosen (raising your hand and following reading with your finger). The children are often required to raise their hand in the classroom when answering a question, and when they are first learning to read they are instructed to follow with their finger. These behaviours would have been praised throughout the children's schooling history and so may now occur reliably even in the absence of praise. To counter this history of reinforcement, the researcher decided to use descriptive praise for novel behaviours in Study Two.

During two of the sessions in Study Two, the researcher stopped administering praise towards the end of the session while there were still a few opportunities to demonstrate the behaviour. During one of these sessions there was a peak in the percentage of children demonstrating the behaviour even though no praise was being administered (Figure 5). The reason for this peak is unclear as there was no history of reinforcement for these novel behaviours. One possible explanation is that one or two of the children in the group demonstrated the behaviour and so this prompted the rest of the children to also demonstrate the behaviour. This trend was not seen in Figure 6, where once the praise was no longer administered, the percentage of children demonstrating the behaviour dropped to zero. This session however, was slightly unusual in that the child

chosen to demonstrate the target behaviour of raising two hands only did so on one occasion and that was prompted by the researcher. This may have been because the child didn't understand what was required of her, or perhaps she didn't know the answers to the questions. Whatever the reason, the percentage of children demonstrating the behaviour during that session remained low, but did increase with the use of praise.

Whether the behaviour was stated as a rule or descriptively praised when it occurred did not appear to make a large amount of difference. This finding contrasts with the logical argument that a person is unable to follow a rule that they have not been told. This may be because descriptive praise implicitly informs the children about how they should behave in order to gain reinforcement. This appears to have the same effect as being directly informed of specific rules that should be followed in order to gain reinforcement or avoid punishment. The results of this investigation may appear similar to the results seen with modelling. However, modeling is closer to vicarious reinforcement, in that the observer is not demonstrating any behaviour at the time. This investigation looked at implicit reinforcement as the children were all carrying out the same task when reinforced.

The difference seen in the results between Study Two and Study Three may have implications for future research on rule following behaviour. In Study Two the children were not aware of any rule, however, when one child was praised for demonstrating a novel behaviour, the other children within the group also began to demonstrate this behaviour. In Study Three, the children were told at the start of the session a rule that they must follow. Figure 7 shows that the children did not make any attempt to follow this rule until one of the children was

praised for doing so at the third opportunity. In the absence of praise, this rule-following behaviour began to decline, however, once reinforcement was again introduced the children's rule-following behaviour increased. Figure 8 shows that initially rule-following was high (around 80%), but when this behaviour was not reinforced immediately, the rule-following decreased (to 10%). Once the children were reinforced, their rule-following behaviour again increased to a high level and was maintained through the use of descriptive praise. These results show that simply stating a rule was not enough to change the behaviour of the children within the classroom, the researcher also needed to demonstrate that children would be reinforced for following this rule. The implementation of a reinforcer may be required for initial following of a novel rule and for the maintenance of this behaviour with existing rules.

The results of both Studies Two and Three show variability within each session. Sometimes the percentage of children demonstrating the behaviour increased at the same opportunity as praise occurred and sometimes the increase was at the opportunity directly after the one where praise had occurred. As previously mentioned, the reason for this variability is due to which child was praised. This factor may cause some confusion when interpreting the results and should be taken into account when conducting future research.

Opportunity was a factor that needed to be taken into account when interpreting the results of Investigation Two. If a child does not know the answer to a question then they do not have the opportunity to demonstrate the behaviour (of raising their hand to answer) and as a result are not reinforced for doing so. Technically the children can raise their hand regardless of whether they know the

answer or not, but are unlikely to do so in a social setting such as a classroom full of peers, as it could result in later consequences, such as taunts from their classmates. Another scenario within Investigation Two where opportunity was an issue was for specific behaviours, such as a child sounding out words they did not know. If a child did not come across a word they did not know then they would not have had the opportunity to demonstrate the behaviour. This does not mean that they were not willing or able to demonstrate the behaviour. However, when recording whether or not a child demonstrates a behaviour, it is unclear what the reasons behind the lack of demonstration may be.

The use of descriptive praise to reinforce the behaviour of one child was successful at increasing that behaviour in other children within close proximity to the child that was praised. The effects of praise in Investigation Two were short-lived, which attributed to the variability seen in the results. However, there is evidence to suggest that implicit praise is successful when the praise is descriptive. Further research is required to confirm the finding, as Investigation One was only a short investigation conducted at the end of the school term. Future research should compare the effects of implicit praise that includes a description of the behaviour with implicit praise that does not include a description of the behaviour (i.e. descriptive implicit reinforcement Vs non-descriptive implicit reinforcement). Also, it may be interesting to compare the effects of descriptive implicit praise given for behaviour, or for academic performance to see which, if either, is more successful.

## **General discussion**

Sharpley (1985) suggested that using implicit praise for a behaviour that had previously been praised directly would have extinction effects. This finding was not supported in either study of the current investigation. In neither Investigation One or Two did the implementation of implicit reinforcement have any effect on the children's behaviour that had previously been directly reinforced. Also the classroom observations illustrated that the use of implicit praise after direct praise was not common practice amongst the teachers observed, and no other behaviours typical of extinction, such as off-task or aggressive behaviours, were observed when it was used. Overall, the current investigations found no evidence to support the notion that implicit praise received after direct praise has an extinction effect.

The use of implicit reinforcement is advocated throughout the literature to increase both academic performance and behaviour. Investigation One found no evidence to support the use of implicit reinforcement as it had no effect on the children's academic performance. However, during the classroom observations the teacher's use of implicit reinforcement was successful at increasing positive behaviour and gaining compliance from the class, and also for increasing certain aspects of the children's academic performance. The difference was that the teacher's use of implicit praise included a description of the behaviour that was being praised (descriptive praise) whereas the praise used in Investigation One did not. Perhaps a description of the behaviour was required in order to inform the other children of exactly what is expected of them in order to gain reinforcement. This argument was supported in the results of Investigation Two, where the

successful use of implicit reinforcement was achieved through the use of descriptive praise. This argument was also supported in the results of a previously mentioned study (Kazdin, 1973) which found that the behaviour change of the peer was not in the same direction as the behaviour change of the target. It was concluded that this finding may have been due to the lack of specificity in the verbal praise, or the previous history of reinforcement (Kazdin, 1973).

In Investigation One direct praise was the only intervention that increased the children's academic performance to a statistically significant level. Direct praise was also successful at increasing the children's use of target behaviours throughout Investigation Two. During the classroom observations the teachers used direct praise more often than indirect praise, often for academic achievements or to individual children for answering questions correctly when in a group situation. As a result, teachers should continue to use direct praise to increase the academic performance of the children within their classes. It would not be feasible for teachers to use direct praise for every occurrence of positive behaviour exhibited by every child within the classroom. However, administering direct praise to individual children for aspects of their work, while walking around the children's desks when they are engaged in a task, is an achievable goal.

The results of Investigation One show that the children's academic performance only increased significantly when the entire class was directly reinforced rather than just their individual groups. The information collected from the classroom observations shows that teachers often used implicit praise in order to gain compliance from all of the children in the group (e.g. "Well done (name) I can see that you are listening and ready for me to continue"). Once all the children



in the group were listening, the teacher would then praise the group as a whole directly (e.g. “you are all listening fantastically”). Perhaps direct praise to the entire group of children is required in order to maintain high levels of achievement that are accomplished through other methods of reinforcement. In Investigation Two the children were not praised directly as a group when they were all exhibiting the target behaviour. This may explain why the children only exhibited the behaviour for a short period of time, as they did not receive the direct-to-group praise required to maintain the initial high levels of the behaviour seen immediately after praise was given.

Overall, teachers should continue to use both implicit and direct praise in their classrooms, as each form of praise serves a different function. Implicit praise should always include a description of the behaviour that is being praised and should only be used for behaviours or aspects of academic work that all of the children within the group have the capacity to exhibit. Direct praise can be used with individual children for academic performance that is above their usual standard or for achieving something that not all of the other children within the class could do. Direct praise can also be used with large groups when all of the children within the group are exhibiting a positive behaviour, such as staying on-task. The order in which these different types of praise are used does not appear to have any negative effect on the children; however, using direct praise with the entire group after the successful use of implicit praise seems to maintain the high levels of compliance for longer than if implicit praise was used alone.

## **Conclusion**

Direct reinforcement was successful at increasing the academic performance of the children involved in the current investigation to a statistically significant level; therefore teachers should continue to utilise this technique. Implicit reinforcement also appeared to be successful at modifying the behaviour of the children within close proximity to the child that the praise was directed at, but only when this praise included a description of the behaviour that was being reinforced. Observations show that the order in which this reinforcement is delivered (direct before implicit or vice-versa) does not appear to have any negative effect on the child's behaviour and both delivery techniques (direct and implicit) are commonly used in the classroom.

## References

- Amidon, E. & Giammatteo, M. (1965). The verbal behaviour of superior teachers. *The elementary school journal*, 65(5), 283-285.
- Bandura, A., Ross, D., & Ross, S. (1963). Vicarious reinforcement and imitative learning. *Journal of abnormal and social psychology*, 67(6), 601-607.
- Broden, M., Bruce, C., Mitchell, M. A., Carter, V., & Hall, R. V. (1970). Effects of teacher attention on attending behavior of two boys at adjacent desks. *Journal of applied behavior analysis*, 3(3), 205-211.
- Brophy, J. (1981a). Praising effectively. *The elementary school journal*, 81(5), 268-278.
- Brophy, J. (1981b). Teacher praise: a functional analysis. *Review of educational research*, 5(1), 5-32.
- Burnett, P. C. (2002). Teacher praise and feedback and students' perceptions of the classroom environment. *Educational psychology*, 22(1), 5-16.
- Chalk, K. & Bizo, L. A. (2004). Specific praise improves on-task behaviour and numeracy enjoyment: A study of year four pupils engaged in the numeracy hour. *Educational psychology in practice*, 20(4), 335-351.
- Cheyne, J. A. (1972). Direct and vicarious reinforcement: a note on punishment and negative instances. *Journal of educational psychology*, 63(1), 63-68.
- Danner, F. W. & Lonky, E. (1981). A cognitive-developmental approach to the effects of rewards on intrinsic motivation. *Child development*, 52(3), 1043-1052.
- Dennis, W. (1957). A cross-cultural study of the reinforcement of child behaviour. *Child development*, 28(4), 431-438.
- Drabman, R. S. & Lahey, B. B. (1974). Feedback in classroom behaviour modification: effects on the target and her classmates. *Journal of Applied behavior analysis*, 7(4), 591-598.
- Edwards, C. H. (2008). *Classroom discipline and management*, 5<sup>th</sup> edition. John Wiley and sons, Inc.
- Elwell, W. C. & Tiberio, J. (1994). Teacher praise: what students want. *Journal of instructional psychology*, 21(4).
- Filcheck, H. A., McNiel, C. B. & Herschell, A. D. (2001). Types of verbal feedback that affect compliance and general behavior in disruptive and typical children. *Child study journal*, 31(4), 225-248.
- Flanders, J. P. (1968). A review of research on imitative behavior. *Psychological bulletin*, 69(5), 316-337.
- Hattie, J. & Timberley, H. (2007). The power of feedback. *Review of educational research*, 77(1), 81-112.

- Harrop, A. & Swinson, J. (2000). Natural rates of approval and disapproval in British infant, junior, and secondary classrooms. *British journal of educational psychology*, 70, 473-483.
- Harrop, A. & Swinson, J. (2007). The behavioural approach in schools: A time for caution revisited. *Educational studies*, 33(1), 41-52.
- Hayes, B., Hindle, S. & Withington, P. (2007). Strategies for developing positive behaviour management. Teacher behaviour outcomes and attitudes to the change process. *Educational psychology in practice*, 23(2), 161-175.
- Hitz, R. & Driscoll, A. (1989). Praise is the classroom. *Eric development team, Eric digests*.
- Kanfer, F. H., & Marston, A. R., (1963). Human reinforcement: Vicarious and direct. *Journal of experimental psychology*, 65(3), 292-296.
- Kazdin, A. E. (1973). The effect of vicarious reinforcement on attentive behavior in the classroom. *Journal of applied behavior analysis*, 6(1), 71-78.
- Kazdin, A. E. (1981). Vicarious reinforcement and punishment process in the classroom, In (Phillip, S. Strain Eds.) *The utilization of classroom peers as behavior change agents*. Plenum press, New York.
- Kern, L., & Clements, N. H. (2007). Antecedent strategies to promote appropriate classroom behavior. *Psychology in the schools*, 44(1), 65-75.
- Learner, L., & Weiss, R. L., (1972). Role of value of reward and model affective response in vicarious reinforcement. *Journal of personality and social psychology*, 21(1), 93-100.
- Madsen, C. H., Becker, W. C. & Thomas, D. R. (1968). Rules, praise and ignoring: elements of elementary classroom control. *Journal of applied behavior analysis*, 1(2), 139-150.
- Marlatt, G. A. (1970). A comparison of vicarious and direct reinforcement control of verbal behaviour in an interview setting. *Journal of personality and social psychology*, 16(4), 695-703.
- O'Leary, K. D. & O'Leary, S. G. (1977). *Classroom management, the successful use of behaviour modification*, 2<sup>nd</sup> edition. US: Pergamon press, Inc.
- Ollendick, T. H., Dailey, D., & Shapiro, E. S. (1983). Vicarious reinforcement: expected and unexpected effects. *Journal of applied behavior analysis*, 16(4), 485-491.
- Ollendick, T. H., Shapiro, E. S., & Barrett, R. P. (1982). Effects of vicarious reinforcement in normal and severely disturbed children. *Journal of consulting and clinical psychology*, 50(1), 63-70.
- Roscoe, E. M., Fisher, W. W., Glover, A. C. & Volkert, V. M. (2006). Evaluating the relative effects of feedback and contingent money for staff training of stimulus preference assessments. *Journal of applied behavior analysis*, 39(1), 63-77.
- Sechrest, L. (1963). Implicit reinforcement of responses. *Journal of educational psychology*, 54, 197-201.
- Sharpley, C. F. (1985). Implicit rewards in the classroom. *Contemporary educational psychology*, 10, 349-368.

- Sharpley, C. F. (1987). Children's evaluations of the hypothetical administration of implicit rewards in the classroom. *The journal of experimental education*, 55(4), 14-22.
- Sharpley, C. F. (1988). Effects of implicit rewards on adults' motor skill responses. *Journal of educational psychology*, 80(2), 244-246.
- Sharpley, C. F. (1991a). Giving a reason for unfairness: effects of a rationale upon Australian students' performances within an implicit reward situation. *International journal of psychology*, 26(1), 71-81.
- Sharpley, C. F. (1991b). Two strategies for reducing the aversive effects of implicit rewards. *Behavior modification*, 15(2).
- Swinson, J. & Harrop, A. (2001). The differential effects of teacher approval and disapproval in junior and infant classrooms. *Educational psychology in practice*, 17(2), 157-167.
- Swinson, J., & Knight, R. (2007). Teacher verbal feedback directed towards secondary school pupils with challenging behaviour and its relationship to their behaviour. *Educational psychology in practice*, 23(3), 241-255.
- Weisberg, P., & Clements, P. (1977). Effects of direct, intermittent, and vicarious reinforcement procedures on the development and maintenance of instruction-following behaviors in a group of young children. *Journal of applied behavior analysis*, 10(2), 314.
- Wheldall, K. (2005). When will we ever learn? *Educational psychology*, 25(6), 573-584.

## Appendices

Appendix One: group averages and inter-observer reliability from Investigation One.

<b>control group</b>			
<b>baseline</b>	<b>phase 1</b>	<b>phase 2</b>	<b>phase 3</b>
31.5	71.8	58.3	61.9
56.1	76.5	62	76.9
60.2	65.8	68.7	73
72	52.5	57.6	
55.9	59.1	54.4	
56.4	56.2	38.9	

<b>Group One total</b>			
<b>baseline</b>	<b>phase 1</b>	<b>phase 2</b>	<b>phase 3</b>
38.6	60.7	70.1	48
51.5	57.9	53	64.3
51.1	55.1	61.4	64.9
61.4	41	50.2	
51.5	46.2	42.7	
55.4	46.3	28.8	

<b>Group One targets</b>			
<b>baseline</b>	<b>phase 1</b>	<b>phase 2</b>	<b>phase 3</b>
41.3	57.3	n/a	54.3
53.8	57	55.7	65.7
42.8	53.3	58	68
65	38.8	51	
51	45.7	44.7	
57.8	46.3	27.5	

<b>Group One peers</b>			
<b>baseline</b>	<b>phase 1</b>	<b>phase 2</b>	<b>phase 3</b>
36	64	70.1	43.3
49.3	59	51	63.3
55.7	57.7	64	62.5
58.8	45.5	49.3	
52	46.7	40.7	
52.3	46.3	29.5	

<b>Group Two total</b>			
<b>baseline</b>	<b>phase 1</b>	<b>phase 2</b>	<b>phase 3</b>
65.9	84.1	91	67.7
69.6	85.6	78.1	89.9
86.8	82	80.8	90.8
87.5	72.4	79.3	
78.3	84.1	77.3	
75.9	83.4	69.5	

<b>Group Two peers</b>			
<b>baseline</b>	<b>phase 1</b>	<b>phase 2</b>	<b>phase 3</b>
69.3	87	89.7	74
74.3	91.3	76.8	95
91.8	83.5	81	96
92.5	79	85.7	
83.5	92.5	85	
83	89.5	68.5	

<b>Group Two target</b>			
<b>baseline</b>	<b>phase 1</b>	<b>phase 2</b>	<b>phase 3</b>
62.5	82	92.3	59.3
65	80	79.5	84.8
67.5	80.5	80.5	85.5
82.5	65.8	74.5	
73	75.8	69.5	
68.8	77.3	70	

<b>Inter-observer reliability</b>			
<b>baseline</b>	<b>phase 1</b>	<b>phase2</b>	<b>phase3</b>
	100	100	96
86		100	100
92		83	
	100		
92	92	96	
96	92	100	

Appendix Two: examples of the ‘word study’ task used in Investigation One, before and after corrections. (Names and room number have been changed)

Example exercise from Baseline

people keep comeing in to room 1 to lok at the hobit pantings wow these are fantastic said mrs smith alice was amased you have sum rely gud rtists in here

*Corrected sentence*: People keep coming into room 1 to look at the Hobit paintings.

“Wow these are fantastic” said Mrs Smith.

Alice was amazed “you have some really good artists in here” she said.

Example exercise from Phase One

on friday doug and mr bob wnt shopin and bort sum plants for our garden yestaday we planted them I cant wate for them to grow and start to flower our gardens going to be beautiful

*Corrected sentence*: On Friday Doug and Mr Bob went shopping and bought some plants for our garden. Yesterday we planted them. I can’t wait for them to grow and start to flower. Our garden’s going to be beautiful.

Example exercise from Phase Two

im so excited exclaimed nelly me to sed kate thay are of to t ball today to pla at tauwhare school you are luky sed dave

*Corrected sentence*: “I’m so excited” exclaimed Nelly.

“Me too” said Kate. They are off to T ball today to play at Tauwhare School.

“You are lucky” said Dave.