

The Effects of Audio Cueing and an  
Instructions, Feedback and Praise Package  
on the Distribution of Teacher Praise  
to Students of Differing On-Task Levels

by



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Abstract

In an audio cueing system, a teacher is presented with randomly spaced auditory signals via tape recorder or intercom. The teacher is instructed to praise a child who is on-task each time the cue is presented. In this study, a baseline was obtained on the teacher's praise rate and the children's on-task behaviour in a Grade 5 class of 37 students. Children were then divided into high, medium and low on-task groups.

Following baseline, the teacher's praise rate and the children's on-task behaviour were observed under the following successively implemented conditions:

(1) Audio Cueing 1: Audio cueing at a rate of 30 cues per hour was introduced into the classroom and remained in effect during subsequent conditions. A group of consistently low on-task children were delineated. (2) Audio Cueing Plus 'focus praise package': Instructions to direct two-thirds of the praise to children identified by the experimenter (consistently low on-task children), feedback and experimenter praise for meeting or surpassing the criterion distribution of praise ('focus praise package') were introduced. (3) Audio Cueing 2: The 'focus praise package' was removed. (4) Audio Cueing Plus 'increase praise package': Instructions to increase the rate of praise, feedback and experimenter praise for improved



praise rates ('increase praise package') were introduced.

The primary aims of the study were to determine the distribution of praise among high, medium and low on-task children when audio cueing was first introduced and to investigate the effect of the 'focus praise package' on the distribution of teacher praise. The teacher distributed her praise evenly among the high, medium and low on-task groups during audio cueing 1. The effect of the 'focus praise package' was to increase the percentage of praise received by the consistently low on-task children.

Other findings tended to suggest that audio cueing increased the teacher's praise rate. However, the teacher's praise rate unexpectedly decreased to a level considerably below the cued rate during audio cueing 2. The 'increase praise package' appeared to increase the teacher's praise rate above the audio cueing 2 level.

The effect of an increased praise rate and two distributions of praise on on-task behaviour were considered. Significant increases in on-task behaviour were found in audio cueing 1 for the low on-task group, in the audio cueing plus 'focus praise package' condition for the entire class and the consistently low on-task group and in audio cueing 2 for the medium on-task group. Except for the high on-task children who did not change, the effects of the experimental manipulations on on-task behaviour were equivocal.



However, there were some indications that directing 67% of the praise to the consistently low on-task children was more effective for increasing this group's on-task behaviour than distributing praise equally among on-task groups.

Table of Contents

	Page
Acknowledgements . . . . .	ii
Abstract . . . . .	iii
List of Tables . . . . .	vii
List of Figures . . . . .	viii
Introduction . . . . .	1
Method . . . . .	37
Results . . . . .	58
Discussion . . . . .	83
References . . . . .	105
Appendix A . . . . .	110
Appendix B . . . . .	111
Appendix C . . . . .	113
Appendix D . . . . .	116
Appendix E . . . . .	118
Appendix F . . . . .	120
Appendix G . . . . .	121
Appendix H . . . . .	123
Appendix I . . . . .	126
Appendix J . . . . .	128



List of Tables

Table	Page
1. Reliabilities for teacher praise rate . . . . .	59
2. Reliabilities for recipient of praise and type of praise . . . . .	61
3. Reliabilities for child behaviour . . . . .	62
4. Percentage of academic, social and neutral praise for each audio cueing phase . . . . .	70

List of Figures

Figure	Page
1. Daily rate of teacher praise . . . . .	63
2. Daily percentage of praise directed to the eight consistently low on-task children . . . . .	68
3. Percentage of on-task behaviour for the class . . . . .	72
4. Percentage of on-task behaviour for the high, medium and low on-task groups . . . . .	76
5. Percentage of on-task behaviour for the consistently low on-task group . . . . .	80



Sundel and Sundel (1975) define a positive reinforcer as "a stimulus whose presentation following a response increases the strength of that response." Praise is a positive reinforcer which has been demonstrated to increase appropriate classroom behaviours (e.g. Schutte & Hopkins, 1970; Thomas, Becker & Armstrong, 1968). These studies suggest that if a teacher praises a child immediately after the child has done something appropriate (e.g. following the teacher's instructions, sitting quietly, attending to work), the child will be likely to repeat that behaviour in the future.

A number of studies suggest that teachers tend to rely on disapproval rather than praise as a means of classroom control (e.g. Thomas, Presland, Grant & Glynn, 1978; White, 1975). However, the use of disapproval has a number of disadvantages. Disapproval given immediately after some inappropriate behavior has occurred may function as a positive reinforcer and may actually increase the behavior one is trying to decrease (Thomas et al., 1968). A person who delivers punishment, such as the teacher who frequently disapproves, may be avoided by the recipient of the punishment (Sundel & Sundel, 1975). A person who received punishment may become verbally or physically aggressive (Sundel & Sundel, 1975).

The use of praise in the classroom is desirable in that praise can be used to increase appropriate classroom behaviours and is not associated with the undesirable effects of punishment techniques. Because teachers tend not to use praise as a method of classroom management, various techniques have been devised to increase teacher praise rates. These techniques include instructions (e.g. Baer & Baer, 1974), feedback (e.g. Rule, 1972), response cost and positive reinforcement (McNamara, 1971), self control (e.g. Szykula & Hector, 1978), social modeling (e.g. Ringer, 1973), direct intervention (Rule, 1975), "packages" which combine various techniques (e.g. Cossairt, Hall & Hopkins, 1973) and audio cueing (e.g. Van Houten and Sullivan, 1975).

One interesting question which can be raised with regard to increasing teacher praise rates using the above methods is which children in the class receive the praise. In any given class, children will vary in the amount of time they spend engaging in appropriate or on-task behaviours. Children could be divided into high, medium and low on-task groups based on the amount of on-task behaviour displayed. When a teacher's praise rate is increased, does the teacher direct equal amounts of praise to the various on-task groups or does one group receive more praise than another? An additional question is whether distributing praise equally among the high, medium



and low on-task groups is more effective in increasing on-task behaviour than an alternate distribution of praise, such as directing most of the praise to the low on-task children.

The literature review will address the following issues: (a) effects of teacher praise and attention on appropriate classroom behaviour; (b) natural rates of praise in the classroom; (c) distribution of teacher praise according to student's level of on-task behaviour; and (d) techniques for increasing teacher attention and praise for appropriate classroom behaviour.

#### Effects of Teacher Praise and Attention on Appropriate Classroom Behaviour

Prior to discussing individual studies, a word on terminology is in order. Studies vary in the precise word used to describe a class of behaviours as well as the specific behaviours included in that class. In a given study, any or all of the following behaviours might be referred to as "appropriate behaviours," "constructive behaviours," "relevant behaviours" or "on-task behaviours": orientation to the appropriate object or person (e.g. lecturing teacher), sitting at the desk, being quiet and following instructions. Behaviours referred to as "inappropriate behaviours," "disruptive behaviours" or "deviant

behaviours" might include walking around the room instead of working on an assignment, making noises with objects, conversing with a neighbour and attending to toys or objects which are not related to the lesson being taught.

"Praise" usually refers to a verbal statement of commendation directed towards one or more students. "Teacher attention," "positive teacher attention" or "teacher approval" is generally a broader category than praise and usually includes some combination of verbal praise, facial expression, speaking to a child and/or physical contact. "Disapproval," "negative teacher attention," or "reprimands" generally refer to a verbal criticism or a statement which indicates that the child's behavior is unacceptable. Thomas et al. (1968) also included the non-verbal aspects of physical contact and facial expression within the category of teacher disapproval. In this discussion, the terms "appropriate behaviours," "inappropriate behaviours," "praise," "attention" and "disapproval" will be used to describe the behaviours delineated above. It should be noted that the authors of a particular study may have used a different term to describe more or less the same behaviours.

Schutte and Hopkins (1970) demonstrated that a kindergarten class of five girls would respond to instructions more consistently if teacher attention were made



contingent upon compliance to requests from the teacher. Buys (1972) used a procedure in which one Grade 3 and two Grade 4 teachers publicly and privately praised nine disruptive children for appropriate classroom behaviour. Incidents of appropriate behaviour increased for the targeted children, but remained stable for nine controls.<sup>1</sup>

Broden, Bruce, Mitchell, Carter and Hall (1970) increased appropriate classroom behaviour through contingent teacher attention for two boys seated at adjacent desks. Initially, attention was directed towards one boy at a time. It was observed that the boy sitting at the adjacent desk increased the amount of time he spent engaging in appropriate behaviour to some degree when the other child was given contingent attention. The greatest gain in appropriate behaviour for the two children combined was observed when both children were given contingent attention at the same time.

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<sup>1</sup>Buys (1972) presented the daily percentage of inappropriate behaviour occurring as the dependent variable. However, Buys (1972) dichotomized all child behaviour into appropriate or inappropriate categories. The percentage of appropriate behaviour occurring on a given day can be deduced by subtracting the percentage of inappropriate behaviour from 100%. The results of the study are discussed in terms of appropriate behaviour, although this information was not directly provided by the author. This comment also applies to studies by Becker, Madsen, Arnold and Thomas (1967), McAllister, Stachowiak, Baer and Conderman (1969), O'Leary and Becker (1968) and Ward and Baker (1968).



In a somewhat unusual procedure, Thomas et al. (1968) asked a teacher who delivered high rates of contingent attention to discontinue attention temporarily to demonstrate that attention was maintaining appropriate classroom behaviours. Removal of attention resulted in a decrease in appropriate classroom behaviours and a sharp increase in inappropriate behaviours such as making noise and leaving the desk.

Praising or attending to appropriate behaviour has often been combined with ignoring inappropriate behaviour (e.g. Becker, Madsen, Arnold & Thomas, 1967; O'Leary & Becker, 1968). In the first study, Becker et al. (1968) found that appropriate behaviours increased from 38% to 71% when these behaviours were attended to and inappropriate behaviours were ignored.

Hall, Lund and Jackson (1968) increased appropriate behaviour in one Grade 1 and five Grade 3 children by attending to appropriate behaviour and ignoring inappropriate behaviours. Ward and Baker (1968) applied a similar procedure to part of a class of Grade 1 Negro children, but included as a control group peers in the same class not exposed to the experimental manipulation. The targeted group showed an increase in appropriate behaviour from 26% to 43% after treatment; the control group decreased slightly in appropriate behaviour by 4%.

O'Leary and Becker (1968) also found that praising appropriate behaviours and ignoring inappropriate behaviours resulted in an increase in appropriate behaviours. This procedure was just as effective in decreasing inappropriate behaviours as was soft reprimands for inappropriate behaviours.

The question could be raised in the latter studies as to whether it was attending to appropriate behaviour or ignoring inappropriate behaviour which resulted in the behaviour changes noted. That attention and/or praise are important variables in modifying behaviour is suggested by the four studies in which teachers were not given specific instructions about ignoring inappropriate behaviour (Broden et al., 1968; Buys, 1972; Schutte & Hopkins, 1970; Thomas et al., 1968). Presumably, no changes occurred in the way the teachers responded to inappropriate behaviour. Further support for the potency of attention in itself is provided by Madsen, Becker and Thomas (1968) who introduced rules into two elementary classrooms and observed the effect, then asked the teacher to ignore inappropriate behaviour and observed the effect, and finally added attention for appropriate behaviour. Rules alone did not alter inappropriate behaviour, while ignoring inappropriate behaviour led to an increase in inappropriate behaviour in one class and no change in



the second class. Only when attention for appropriate behaviour was added was a sizable reduction in inappropriate behaviour observed.

A final study which combined praise for sitting appropriately and being quiet with reprimands for turning around and talking was reported by McAllister, Stachowiak, Baer and Conderman (1969). Being quiet increased from 75% to above 95% during treatment, while appropriate sitting increased from 85% to 96% during treatment. There was no change in the above behaviours in a control class.

All of the studies cited in this section demonstrate the usefulness of praise and attention alone or in combination with other techniques for increasing appropriate and decreasing inappropriate classroom behaviours.

#### Natural Rates of Praise in the Classroom

White (1975) studied natural rates of praise and disapproval in 16 classes ranging from the first to the twelfth grade. In general, teacher rates of disapproval tended to be higher than praise rates. Higher rates of disapproval than praise were especially pronounced for a group of behaviours called "managerial behaviours" or pupil activities involving classroom management (e.g. sitting up straight in a chair). This finding is significant



in that these kinds of behaviours are those frequently targeted for change. In a replication by Thomas, Presland, Grant and Glynn (1978) higher levels of disapproval than praise were found in 10 Grade 7 classrooms.

These studies indicate that teachers fail to praise for appropriate student behaviour, despite the evidence that such praise is effective in enhancing appropriate behaviour in the classroom. Teachers tend to rely on aversive control methods which may actually increase inappropriate behaviour. Experimental evidence for this premise can be found in a number of sources. O'Leary and Becker (1968) observed that loud disapprovals increased inappropriate behaviour. In another study, Thomas et al. (1968) found that frequent disapproval resulted in an increase in inappropriate behaviour from 19.4% to 31.2%. Madsen, Becker, Thomas, Koser and Plager (1970) found that the command "sit down" increased standing up. These reports further emphasize the need to train teachers to use praise as a classroom management technique.

#### Distribution of Teacher Praise

##### According to Students' Level

##### of On-Task Behaviour

No studies were available which investigated how teachers distribute praise among children varying in

on-task levels. A few studies have attempted to alter child or student behaviour in a more appropriate or inappropriate direction to determine whether the teacher's responses would change. If it were known that teachers tend to give attention for appropriate behaviours and disapproval for inappropriate behaviours, it might be predicted that teachers would praise children engaging in high levels of appropriate behaviour more than children engaging in fewer appropriate behaviours. However, findings in this area have been contradictory.

Sherman and Cormier (1974) found that praise increased and disapproval decreased for two disruptive students when their behaviour improved. Klein (1971) requested that students in his college class behave either appropriately or inappropriately and observed the effect on the behaviour of guest lecturers. The guest lecturers tended to be more positive (e.g. helped students, smiled, established eye contact, etc.) when students behaved appropriately than when students behaved inappropriately. If teachers respond differentially to appropriate and inappropriate behaviours displayed by the class as a whole, then the possibility exists that teachers respond more positively to high in comparison to low on-task children within a class.



In contrast to the above studies, Drabman and Lahey (1974) found a teacher's reactions to a child to be unrelated to his classroom behaviour. Seymour and Stokes (1976) found staff attention to be independent of work production in four institutionalized adolescents. These studies suggest that teacher praise would be unrelated to students' on-task behaviour.

Because there has been no previous research to determine whether a teacher's distribution of praise is related to the amount of appropriate behaviour exhibited by individual children within a class and related research is contradictory, no predictions can be made about how a teacher will distribute praise in the classroom.

Techniques for Increasing Teacher Attention  
and Praise for  
Appropriate Classroom Behaviour

Studies which demonstrate that teachers tend to rely on disapproval rather than praise in classroom interactions (Thomas et al., 1978; White, 1975) underscore the necessity of directly training teachers to increase praise. Attempts have been made to increase teacher attention and praise by using a variety of techniques. Major findings relating to some of these methods are presented in the following discussion. Audio cueing is presented in some detail due to its importance to the present experiment.



(1) Instructions

Providing instructions generally involves asking the teacher to increase her rate of attention or praise to appropriate pupil behaviour. However, it is difficult to make comparisons among studies using instructions because other information is often provided, the nature of which changes from experiment to experiment. In one study, teachers were informed that increases in contingent praise leads to increases in appropriate behaviour (Cossairt, Hall & Hopkins, 1973), while in another study (Parsonson, Baer & Baer, 1974) feedback concerning baseline performance was included. Most forms of instructions led to no change in teacher behaviour (Cossairt et al., 1973; Parsonson et al., 1974; Rule, 1972). One exception was reported by Nelson, Hay, Hay and Carstens (1977) who found that instructions increased teacher praise rates in two teachers. This study differed from the others in that teachers were given daily reminders to increase praise, a variable which may be critical to the effectiveness of instructions.

(2) Feedback

As in the case of instructions, feedback may be given in many different forms. Feedback on teacher and/or student behaviour may be administered verbally (Cossairt et al., 1973; Parsonson et al., 1974) or graphically (Rule, 1972). Combinations of verbal and graphic

feedback (Cooper, Thomson & Baer, 1970) or visual cues and delayed graphs (Reich, 1975) have also been used. McNamara (1971) delivered electric impulses to the teacher's arm for immediate feedback and also provided delayed daily graphic feedback. Several researchers (Rule, 1972; Saudargas, 1972; Thomas, 1971) trained teachers to provide their own feedback by scoring videotapes of their classroom performance.

Feedback produces variable results. However, it appears that in general, the more immediate the feedback, the greater the likelihood of success. For example, Thomas' (1971) procedure of having teachers score a videotape immediately after teaching a lesson was effective, whereas Rules' (1972) 24 hour delayed scoring procedure was ineffective. Verbal feedback delivered every 3 to 5 minutes altered teacher behaviour (Parsonson et al., 1974), but feedback at the end of every session resulted in no change (Cossairt et al., 1973).

### (3) Response Cost and Positive Reinforcement

McNamara (1971) compared feedback alone to feedback plus response cost and feedback plus positive reinforcement. The goal of the study was to increase attention to children raising their hands (HR) and to decrease attention to children calling out answers (CO).



In McNamara's (1971) procedure, feedback on appropriate and inappropriate attention was administered through electric pulses to the arm plus daily graphic feedback. Response cost is a technique in which a positive reinforcer is removed following the occurrence of a specific inappropriate behaviour. In McNamara's (1971) response cost procedure, the teacher lost a point for attention to a CO and earned a point for attention to an HR. In the positive reinforcement condition, the teacher earned a point for attention to an HR.

Points were exchanged for beer. Teachers were given a bonus of two additional cans of beer for days in which the teachers ignored all instances of COs. All conditions resulted in decreased attention to COs to zero and increased attention to HRs. Thus, feedback alone was just as effective as adding tangible rewards and punishments to the feedback procedure.

#### (4) Self-Control

Two studies have investigated the use of self-monitoring. In Van Houten and Sullivan's study (1975), teachers counted praise statements on counters and graphed their rates. In the second study (Nelson et al., 1977), teachers self-monitored praises and disapprovals in separate conditions and reported their rates to the



classroom observer. Self-monitoring was either ineffective or unpredictable in outcome.

Szykula and Hector (1978) used a broader range of self-control techniques involving assessment, observation, recording, cueing, performance criteria and positive reinforcement. All procedures were administered by the teacher to herself. These combined procedures were effective in increasing praise statements.

(5) Social Modeling

Ringer (1973) used a classroom helper to model the simultaneous administration of tokens and praise. The teacher learned to hand out tokens, but failed to increase her rate of praise.

Levin (1973) reported that following a one hour social modeling procedure, eight teachers increased their use of praise by 35%. However, Levin (1973) actually incorporated other procedures, such as rehearsal, into his approach. Modeling or any one of a number of factors may be responsible for the finding.

(6) Direct Intervention

Rule (1972) devised a technique called direct intervention. In Rule's (1972) procedure, the experimenter interrupted the teacher every 5 minutes. If the teacher had met a criterion praise rate, he/she

was praised. If the goal for praise rate was not attained, the experimenter replaced the teacher and instructed the class for 5 minutes. During the time the experimenter conducted the class, the teacher recorded the experimenter's praise rate. This procedure was effective in increasing praise.

A number of learning principles were applied within the direct intervention procedure. The teacher received informative feedback every 5 minutes about his/her performance and praise if a criterion praise rate had been met. Informative feedback alone and in combination with praise have been found to act as positive reinforcers for behaviour (e.g. Cossairt et al., 1973; Leitenberg, Agras, Thompson & Wright, 1968). The procedure of asking the teacher to stop teaching for 5 minutes if he/she fell below a criterion praise rate might be viewed as a punishment for a low praise rate. In behavioural terms, punishment is "the presentation of an aversive event or removal of a positive event contingent upon a response which decreases the probability of that response" (Kazdin, 1980). During the time that the teacher was penalized, he/she was required to observe the experimenter's praise rate. Demonstrating the desired response aids in the acquisition of behaviours (Sundel & Sundel, 1975).



(7) "Packages"

A combination of procedures may be administered simultaneously. Cossairt et al. (1973) combined instructions, feedback and praise to increase teacher praise. "Packages" with other components have been reported by Cossairt (1974) and Clark, Macrae, Ida and Smith (1975). All studies found that the combined procedures increased praise rates.

(8) Audio Cueing

Development of the audio cueing technique by Van Houten and Sullivan (1975) was inspired by Hall et al.'s (1968) visual prompting procedure. In the visual prompting procedure, an observer cued the teacher to attend to child behaviour by holding up a colored square of paper. Audio cueing involves playing a sound such as a beep via intercom or tape recorder at variable intervals. Upon hearing the cue, the person administering contingencies carries out a specified behaviour. So far, this technique has been used to increase teacher praise, but this system could be used to cue other kinds of therapist behaviour such as placing a child in time-out (suggested by Noseworthy Spencer, 1977) or delivering tokens.

The utility of audio cueing has just begun to be explored. Van Houten and Sullivan (1975) introduced an

audio cueing system into one special, one Grade 4 and one Grade 7 classroom containing 16, 23 and 15 students respectively. In two different phases, audio cues were played over a school intercom on a variable interval schedule at either two or three per minute. The three teachers increased their praise rates to the levels dictated by the cue and sometimes even surpassed the cued praise rate. When audio cues were removed, the teachers maintained or increased their high levels of praise.

Noseworthy Spencer (1977) replicated and extended the findings of Van Houten and Sullivan (1975) in a special systematic integration class. The purpose of the class was to teach four disruptive children with average or higher intelligence appropriate classroom behaviour. The long range goal was integration of the students into a regular class. Increasing appropriate classroom behaviour was accomplished through the use of positive reinforcement (verbal praise, points and 10 minute play breaks) contingent upon appropriate behaviour, and time-out contingent upon inappropriate behaviour.

Noseworthy Spencer (1977) addressed three major issues in her study: (a) application of the technique to a class of children with severe behaviour problems; (b) generalization of increased frequency of praise to non-cued periods; (c) effects of increased praise on appropriate,



neutral and inappropriate behaviour. Neutral behaviours were those which did not fit into either the appropriate or inappropriate categories as defined by Noseworthy Spencer (1977), such as talking to the teacher during a play break.

In the Noseworthy Spencer (1977) study, the children were observed daily for a two hour period divided into four half-hour intervals. During intervention, two intervals were cued and two were not. Two patterns of cued intervals, BBAA and ABBA, where A represents non-cued intervals and B represents cued intervals, were compared in order to rule out fatigue effects. Praise increased from 2.4 per 30 minutes to an average of 17.2 per 30 minutes during the cued phase of the intervention and 8.9 per 30 minutes during the non-cued phase of the intervention. The data indicated that the difference in praise rate between cued and non-cued periods was not due to fatigue effects.

Appropriate behaviour was measured at an average of 58% prior to treatment, while inappropriate behaviour averaged 11%. An increase in appropriate behaviour to 76% and a decrease in inappropriate behaviour to 5.5% occurred during treatment. These gains were maintained when audio cues were withdrawn, and further improvements to 90% appropriate behaviour and 0% inappropriate behaviour were found on reinstatement of the treatment. Although

Noseworthy Spencer (1977) had intended to cue time-out, this was unnecessary because of the low rate of inappropriate behaviour.

In summary, it was demonstrated that increasing praise by means of an audio cueing system led to increases in teacher praise, improvements in child behaviour and generalization of high praise levels to non-cued periods. The procedure was applicable to a class of severely disturbed children. Noseworthy Spencer (1977) argued that she was an unobtrusive observer in that her interest in the class revolved around improving the children's rather than the teacher's behaviour and the teacher believed that she was not being observed. Thus, there is some suggestion that the procedure would have been effective even in the absence of an observer.

#### The Present Investigation

In studies which have attempted to alter child behaviour through attention or praise, either a few students (e.g. Broden et al., 1970) or the entire class (e.g. Thomas et al., 1970) was targeted for change. When a small number of students were targeted for change, it was usually because these students were labeled as engaging in many inappropriate behaviours. Presumably, the teacher increased attention and praise mainly to these students.



To date, the audio cueing of praise has implicitly been directed towards the entire class. The teachers have been encouraged simply to increase their praise rates with no particular instructions regarding which children should receive praise. This situation leads to several interesting questions.

First of all, in average classrooms such as the ones studied by Van Houten and Sullivan (1975), children within a class could be divided into high, medium and low on-task groups depending upon the amount of on-task behaviour displayed. When a teacher's praise rate is increased with audio cueing, will the teacher distribute her praise equally among the various on-task groups or will the teacher adopt some other distribution of praise? It seems reasonable to suggest that the low on-task children should be the recipients of a fair share of the praise, since these children are most in need of behaviour change. It is possible that these children receive significantly less praise than the remaining children when the teacher's praise rate is increased.

Previous research is of little help in predicting how teachers distribute their praise among various on-task groups when an audio cueing system is introduced. Research by Klein (1971) and Sherman and Cormier (1974)

suggests that teachers reciprocate positive student behaviours, while studies by Drabman and Lahey (1974) and Seymour and Stokes (1976) suggest that there is no relationship between appropriate child behaviour and adult or teacher praise. These studies compared teacher or adult reactions to the same students or children under two different conditions varying in the amount of appropriate behaviour displayed. The results may not apply to teacher reactions to children within the same class varying in on-task levels.

Furthermore, the studies reviewed examined how teachers respond to child behaviour under natural conditions (i.e. without any special procedures to increase teacher praise rates). Artificially increasing the teacher's praise rate may result in a different distribution of praise than is found under natural conditions. Due to the lack of previous research, no specific hypothesis was stated for the first question addressed in the study:

- (1) Will the teacher direct equal amounts of praise to the high, medium and low on-task children when an audio cueing system is introduced?

Techniques for altering the teacher's distribution of praise would be especially important for future applications of audio cueing if it could be determined



that one distribution of praise results in more on-task behaviour than another. One potential technique for altering the teacher's distribution of praise was of primary concern in the current study. Cossairt et al. (1973) found that instructions, feedback and praise were effective in increasing teacher praise rates. A similar package was introduced to modify the teacher's distribution of praise.

In this study, the teacher was asked to direct 67% of her praise to a group of children delineated by the experimenter. These children were the consistently low on-task children, a subgroup of the low on-task children who were resistant to change.<sup>2</sup> Following each session, the teacher was given feedback on the percentage of praise directed to the targeted children, and experimenter praise if she met or surpassed the 67% criterion. This package designed to alter the teacher's distribution of praise will be referred to as the 'focus praise package'. The first hypothesis was:

- (1) If, in addition, to audio cues, there are presented instructions to focus<sup>3</sup> the

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<sup>2</sup>A primary consideration in selecting this distribution was to increase praise to some of the low on-task children if this group were not already receiving most of the praise.

<sup>3</sup>In other words, direct 67% of the praise to the targeted group.

distribution of praise, feedback and experimenter praise for meeting or surpassing a criterion distribution of praise, then there is a corresponding change in the distribution of praise by the teacher.

Another concern addressed in this study was how teachers could distribute praise to maximize the amount of time spent on-task by the entire class. The two patterns of praise compared were distributing equal percentages of praise to high, medium and low on-task groups versus directing 67% of the praise towards the consistently low on-task children. Due to the absence of previous research, no hypothesis was stated for the second question addressed in this study:

- (2) Will an even distribution of praise among high, medium and low on-task children result in higher levels of on-task behaviour for the class as a whole compared to directing 67% of the praise to a small group of consistently low on-task children?

Both of the previous studies on audio cueing (Noseworthy Spencer, 1977; Van Houten & Sullivan, 1975) found increases in praise rates with the introduction



of an audio cueing system. Increases in appropriate classroom behaviour with higher levels of teacher attention and praise have been found in numerous studies (e.g. Broden et al., 1968; Buys, 1972; Schutte & Hopkins, 1970; Thomas et al., 1968). The only previous study which attempted to relate higher levels of praise within an audio cueing system to increased levels of appropriate classroom behaviour was the investigation by Noseworthy Spencer (1977). The class in the Noseworthy Spencer (1977) study was exceptional in that there were only four students in the class and these students engaged in high levels of inappropriate behaviour. The present study extends previous research by investigating the effects of increased praise rates during audio cueing on the amount of on-task behaviour in a typical class of 37 students. Based on the foregoing research, it is hypothesized that:

- (2) The effect of audio cues on teacher praise is to increase the rate of teacher praise.
- (3) Increased teacher praise rates during audio cueing conditions increases the rate of class on-task behaviour.

#### Research Design

The general design planned for this study was an A-B-BC-B-BC time-series design. A was the level of

teacher and student behaviour prior to audio cueing. B was the presentation of an audio cueing system in which a teacher was cued to give 30 praises per hour. C was the 'focus praise package'. The dependent variables measured throughout the study were:

(a) amount of child on-task behaviour for the entire class and the high, medium, low and consistently low on-task groups, (b) teacher praise rate and (c) percentage of praise directed to the high, medium, low and consistently low on-task groups, (d) (distribution of praise).

The planned general design had to be altered in the final condition due to some unexpected findings in the second B phase. The actual general design implemented was an A-B-BC-B-BD time-series design. Each question and hypothesis was tested using a different design within the general design. Before discussing the design of this experiment, time-series designs in general will be considered.

#### A-B, A-B-A and A-B-A-B

#### Time-Series Designs

In an A-B time-series design, the target behaviours are specified in clearly observable and measurable terms and repeated measurement is taken throughout the A and B phases of the experiment. The A or baseline phase



involves observing the frequency of the behaviour prior to any experimental manipulations. In the B phase, treatment is introduced and changes in the dependent variable are observed. Changes in the level of the dependent variable after the introduction of the treatment are attributed to the effects of treatment. However, in the A-B time-series design there are severe limitations involved in making inferences about the effect of the treatment on the dependent variable (Hersen & Barlow, 1976).

The first of these possible limitations is related to baseline trend (Hersen & Barlow, 1976). Trend refers to a tendency for the dependent variable to consistently increase or decrease within a phase. If the trend in the baseline phase continues into the treatment phase, then it is not clear as to whether the increase represents the effect of the treatment or the natural course of the behaviour. This difficulty can be overcome by introducing treatment when the trend observed during baseline is dissimilar to the trend predicted during treatment. The problem with trends may occur in any time-series design when changing from one phase to the next.

A more serious problem with the A-B time-series design is that changes occurring in the B phase may be due to an event correlated with treatment,

instead of treatment itself (Hersen & Barlow, 1976). Campbell and Stanley (1966) refer to this design as a "quasi-experimental design" since variables other than the independent variable may produce the changes observed in the treatment phase.

Although the A-B time-series design has serious limitations, this design can be used when a more stringent design is not possible. It can be useful in providing some objective information and suggesting further avenues of experimental investigation (Hersen & Barlow, 1976).

In an A-B-A time-series design, a baseline is obtained (A), then a treatment is presented (B) and removed again (A). The latter condition may be called a "withdrawal condition". If after the baseline measurement, the behaviour increases (or decreases) with the application of the treatment, then moves toward the baseline level when the treatment is withdrawn, there is a high degree of certainty that the treatment variable is responsible for the changes. Unless the natural history of the behaviour under study were to follow identical changes in trends, it is highly unlikely that the observed pattern of behaviour would be due to some uncontrolled variable (Hersen & Barlow, 1976).



The A-B-A time-series design allows for an analyses of the controlling effects of treatment, and hence is acceptable from an experimental viewpoint (Hersen & Barlow, 1976).

In the A-B-A-B time-series design, another treatment condition is added. This design allows another opportunity to observe the effects of treatment on the behaviour under study, and therefore lends further support to the controlling effects of the treatment. Both the A-B-A and A-B-A-B time-series designs are not appropriate for treatments known to lead to permanent changes in behaviour, such as the effect of psychosurgery on behaviour.

Primary Research Concerns:

Determining and Modifying

the Teacher's Distribution of Praise

Among High, Medium and Low

On-Task Children

This study was designed primarily to explore the two issues dealing with determining and modifying the teacher's distribution of praise among the high, medium and low on-task children. These issues were of primary concern in the development of this study due to lack of previous research in this area. The hypothesis of primary interest to the current

investigation was stated earlier in the introduction as hypothesis 1: If, in addition to audio cues for praise, there is presented instructions to focus the distribution of praise, feedback and experimenter praise for meeting or surpassing a criterion distribution of praise, then there is a corresponding change in the distribution of praise by the teacher. This hypothesis was planned to be explored through an A-B-A-B time-series design corresponding to the last four conditions (A-B-BC-B-BC) in the general design. Since the effects of instructions, feedback and praise on teacher praise rates did taper off after their withdrawal in the Cossairt et al. (1973) study, it was felt that this design was appropriate.

The research question of primary concern in the design of the experiment was stated earlier as question 1: Will the teacher direct equal amounts of praise to the high, medium and low on-task groups when audio cueing is introduced? This question was to be tested using a between groups design by comparing the percentage of praise directed to the high, medium and low on-task groups in the first audio cueing condition.

The B-BC-B-BC sequence allowed for an adequate experimental test of the primary research issues. The A condition was added primarily to identify the high,



medium and low on-task children prior to audio cueing so that the on-task level of the person receiving each praise statement would be known. The A phase also allowed observations of child and teacher behaviour prior to audio cueing.

Alteration in the General Design  
and Addition of Hypothesis

Based on the results of Noseworthy Spencer (1977) and Van Houten and Sullivan (1975), it was assumed that the teacher's praise rate during audio cueing would match or surpass the cued rate. However, during the second B phase in the general design (A-B-BC-B-BC), the teacher's praise rate dropped drastically with only four praises per hour being obtained in several sessions.<sup>4</sup> The reintroduction of the 'focus praise package' used to alter the teacher's distribution of praise was inappropriate due to the low rate of praise. Alternatively,

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<sup>4</sup>While it is not usual to present results in the "Introduction" section, the unexpected drop in the teacher's praise rate led to an alteration in the general design, alterations in the designs used to test each hypothesis and question and the addition of a new hypothesis. It is less confusing to the reader to describe the changes in the "Introduction" section. The alternative would be to describe one design for exploring a particular issue in the "Introduction" section, then to introduce and discuss a different design for the same issue in the "Method" or "Results" section. The former is easier to follow.

a new condition was implemented to increase the teacher's praise rate.

In addition to receiving audio cues, the teacher was instructed to increase her praise rate to 30 praises per hour. The teacher was given feedback on her rate of praise following each session, and experimenter praise if she showed an improvement over the previous day's rate. This package designed to increase the teacher's praise rate will be referred to as the 'increase praise package'. Instructions, feedback and praise have been found to be effective in increasing teacher praise rates (Cossairt et al., 1973). A fourth hypothesis was added to the study:

- (4) If, in addition to audio cues for praise, there are presented instructions to increase the praise rate, feedback and experimenter praise for an improved teacher praise rate, then there is an increase in the teacher's praise rate.

The alteration in procedure resulted in relabeling the general design to an A-B-BC-B-BD time-series design, where D was the implementation of an 'increase praise package'. The fourth hypothesis was tested using an A-B time-series design in which the praise



rates in the general design's second B and BD phases were compared (A-B-BC-B-BD).

Effects of the Alteration  
in the General Design on  
Testing the Primary Research Issues

The change in the general design did not interfere with testing question 1, which was directed towards determining how the teacher would distribute her praise when audio cueing was first introduced. However, hypothesis 1 was tested with an A-B-A time-series design instead of an A-B-A-B time-series design. Hypothesis 1 stated that if, in addition to audio cues for praise, there is presented instructions to focus the distribution of praise, feedback and experimenter praise for meeting or surpassing a criterion distribution of praise, there is a corresponding change in the distribution of praise by the teacher. The A-B-A time-series design corresponded to the B-BC-BD segments of the general design (A-B-BC-B-BD). The second B condition was not considered. Differences in distribution of praise between the B condition and any others might be due to the lowered praise rate rather than the removal of the 'focus praise package'.

### Secondary Research Concerns

The A-B-BC-B-BD time-series design allowed for the investigation of several issues. While some of these issues were tested with the weak A-B time-series design, possible explanations of the data obtained could be raised and future research suggested. A return to the A condition of the general design would have resulted in A-B-A time-series designs for some of the secondary research issues. However, the extra time required to reintroduce the A condition was not available. The secondary research issues with their associated designs were:

- (2) Hypothesis 2: The effect of audio cues on teacher praise is to increase the rate of teacher praise. This hypothesis was tested with an A-B time-series design, where the A condition corresponded to the A condition in the general design and the B condition corresponded to the (B-BC-B) phases in the general design (A-B-BC-B-BD). The BD phase in the general design was not considered because the teacher's praise rate in this phase could be the result of audio cueing and/or the 'increase praise package'.



- (3) Hypothesis 3: Increased teacher praise rates during audio cueing conditions increases the rate of class on-task behaviour. This hypothesis was tested using an A-B time-series design by comparing the baseline condition in the general design with the last four audio cueing conditions (A-B-BC-B-BD). The second B condition was included, since the teacher's praise rate in this condition was above the baseline level, even if below the cued rate.
- (3) Question 2: Will an even distribution of praise among the high, medium and low on-task children result in higher levels of on-task behaviour for the class as a whole compared to directing 67% of the praise to a small group of consistently low on-task children? This question was explored using an A-B-A time-series design by comparing the first B, BC and BD phases in the general design (A-B-BC-B-BD). The second B condition was omitted due to the possible effect of the lowered praise rate on on-task behaviour.

Effects of the Experimental Manipulations  
on the High, Medium, Low and  
Consistently Low On-Task Groups

This investigation provided levels of on-task behaviour for the high, medium, low and consistently low on-task groups over the various conditions. This data was statistically analyzed to consider the possible differential effects of an increased rate of praise and two distributions of praise on each on-task group.



## Method

### Subjects

A female teacher with 17 years of teaching experience and her Grade 5 class of 19 females and 18 males participated in the study. This teacher was selected because she was the first teacher in St. Mary's School, St. John's, Newfoundland, to volunteer for a project described as (a) requiring approximately 14 weeks of observation; (b) being designed to increase on-task behaviour in the classroom. It was specified that the teacher must be willing to try new classroom management techniques, the nature of which was unspecified. The class was judged by both the experimenter and the teacher to be average in terms of the amount of inappropriate behaviour which took place.

### Apparatus

The cue used for praise was a counter service bell struck once. Cues were taped on a microcassette recorder (Sony, model number M101). The procedure for selecting cues involved generating a series of random numbers between 1 and 3600. Each number corresponded to a second of time. Cues were taped at a rate of 30 per 60 minutes at these random intervals, with two restrictions:

(a) cues were separated by at least 10 seconds;  
(b) between 14 and 16 cues were played in each half-hour of a one hour session. This procedure resulted in a variable interval schedule with cues occurring on the average of once every two minutes. A new tape was made for each session. The microcassette recorder was carried by the teacher in a small patent leather pouch which was hung over her shoulder. The sound was relayed through an earphone so that the cues were audible only to the teacher.

For the purpose of co-ordinating observations between two observers, a y-adaptor<sup>5</sup> was attached to a cassette recorder (Lloyd, model number 2V96A-198B). The y-adaptor allowed the two observers to simultaneously listen to a tape which emitted the word "record" at 10 second intervals. The word "record" marked the beginning and end of the observation unit.

#### Behavioural Descriptions

Child behaviour was scored as being either on-task or off-task. The criteria for scoring are described below.

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<sup>5</sup>The author would like to acknowledge the assistance of Gordon Butler, who constructed the y-adaptor.



1. On-Task Behaviour

The child being observed in a 10 second interval was considered to be on-task if he/she engaged in all of the following behaviours.

- (i) Manipulation of materials: The child's hands were manipulating only items necessary in the on-going teacher specified activity (holding a pen or pencil or other object while the child oriented his head towards a speaker was excluded). At times when the activity was free or unspecified (e.g. roll call, teacher called out of the room for a few moments before assigning work), manipulation of any material was considered on-task.
- (ii) Sitting at the desk: The child was sitting at his/her desk with his/her feet planted firmly on the floor or tucked under him/her. He/she remained seated unless instructed otherwise. The child was allowed to sharpen his/her pencil or go to the washroom without permission, provided that the teacher was not lecturing to the class.
- (iii) Head orientation: The child's head was oriented in a direction dictated by the teacher-specified

activity. Some common situations and appropriate head orientations were:

- (a) Teacher giving instructions or teaching to the class or to particular students:  
If the child were addressed, he/she was looking at the teacher.
- (b) Teacher-student interactions: If the child were not called upon, he/she was not necessarily gazing directly at the teacher or students addressed, but was not oriented towards materials on the desk. Working on materials required in the lesson was excluded if it was appropriate to be looking at them, such as correcting an answer while another student spoke to the teacher.
- (c) Teacher writing on the board or directing attention to materials in the class: The child was looking at these materials or at the teacher.
- (d) Copying from the board: The child was gazing at the board or writing in his/her scribbler.
- (e) Working at seat: The child was looking at or working on only materials specified by the teacher.



(f) Unspecified times: These were times when the teacher had not requested any particular work activities, such as when a child had completed his/her assignment but had not been given additional work. Any head orientation was acceptable as long as it was not aimed at other children engaged in inappropriate acts (see below) or as long as the child was not staring out of the window.

Note:

- (1) Sometimes two behaviours were appropriate in a given situation. Either defined appropriate behaviour was scored as correct. Example: The teacher told the children to correct their math errors. A few minutes later, the public address system came on. Correcting math or orientation to the public address system was scored as correct.
- (2) In cases of doubt, as when the observer was unsure of what materials the child had on his desk, the child's behaviour was scored as appropriate.

## II. Inappropriate Behaviours

The child's behaviour was scored as inappropriate if he/she engaged in any of the following behaviours at any point during the 10 second observation interval.

- (i) Talking to a neighbour. This behaviour was considered to have occurred if the child could be heard or if the observer could see the child's lips move.
- (ii) Head oriented towards and/or moving around objects other than those required by the task at hand. Example: playing with a toy figure.
- (iii) Using task-required materials in an inappropriate manner. Example: balancing a pencil on a finger or scribbling in a book.
- (iv) Disturbing a neighbour by making physical contact with the child.

Teacher praise was defined as a commendatory statement made by the teacher to an individual child or group of children contingent upon on-task behaviour. Phrases such as "that's right," "that's correct" and "okay" were not scored as praise. Praise was also coded according to:

### I. Recipient

The recipient of praise was the specified child to whom praise was addressed. If a praise statement was



directed towards more than five students, it was considered to be class praise.

## II. Type

Praise was classified into three types: social, academic and neutral. Social praise was praise directed towards on-task behaviours, such as being quiet and attending to the board. While the teacher was encouraged to praise on-task behaviours, it was expected that she would praise for other things as well. Academic praise was praise given for various aspects of the actual work done, such as praise for neatness or getting 10 answers correct. Neutral praise was praise which did not fall into either social or academic categories. An example of a neutral praise statement would be praising a child for coming to class on time. Breaking down the type of praise into social, academic and neutral categories provided a means for checking whether the teacher actually did praise on-task behaviours most of the time.

## Addendum

Because of problems with reliability, the following rules were added to clarify scoring of teacher praise. It was not felt that the addition of these rules altered the basic definition of praise. The intent of the rules

was to increase consistency in scoring some ambiguous statements which might have been considered praise. These ambiguous statements were not observed until the beginning of audio cueing 1.

Rule 1. Sometimes the teacher made a statement to one child which referred to a behaviour and a praise just made to another child. The statement implied that the currently addressed child engaged in the same act and also was the recipient of the praise. Praise was scored for both children. Example: "You're sitting up, Fred. I'm pleased to see that. You too, Mary." Praise was scored for both Fred and Mary.

Rule 2. If a praise statement was given to one child for a particular behaviour, then a behavioural description only was given to a second child, praise was scored for the first child but not the second. Example: "Michael is studying hard. Good. Sharon is studying hard also." Praise was scored for Michael, but not for Sharon.

Rule 3: A behavioural description, without a commendatory statement indicating that the behaviour is desirable, appropriate, or pleasing to the teacher was not considered praise.

See Appendix A for examples of praise statements and codes.



### Observation Procedures

The author, who served as the main observer throughout the study, was present in the class for approximately two weeks prior to the beginning of the study. The children were observed at the beginning of every morning for approximately half an hour to an hour. Activities occurring during this time were roll call, religious instruction (for 5 to 10 minutes) and mathematics. Observations began 3 minutes after the first bell rang and ended when the teacher completed the mathematics lesson.

Each child was observed in turn for 10 seconds. The order of observation began with the child at the front of a row and continued to the child at the end of the row. This procedure was repeated for each line of seats. When all rows had been observed, the process was repeated until the end of the session. The row to be observed first was changed in a sequential order each morning.

Each on-task and off-task observation was coded according to which seat the child emitting the behaviour was sitting in. At the end of each session, a class seating arrangement list was used to determine which child emitted each on-task behaviour. The number of

on-task behaviours and total number of observations for each child within each session could then be determined. The percentage of on-task behaviour for each child per phase was calculated from these data by dividing the total number of on-task behaviours by the total number of observations for each child within each phase.

When the baseline observations began, child behaviour and teacher praise were observed simultaneously. For each 10 second interval, the child was scored as either on-task or off-task. If teacher praise occurred within an interval, a mark indicating one praise statement was recorded and the recipient(s) and type(s) of praise was/were noted. Sometimes the teacher would offer multiple words of praise to a child for one behaviour within one interval. She might say, for example, "John, you're looking at the board. Good. Excellent." If the praise occurred in one interval and was addressed to the same child for the same behaviour, it was counted as one praise. Following day 20 or 7 days into the initial audio cueing condition, teacher behaviour and child behaviour were observed sequentially to help improve low reliability coefficients. Whether child behaviour or teacher praise was observed first was alternated daily. Within each session, the observers would



alternate between observing child behaviour and teacher praise, with 5 minutes at a time devoted to each category.

### Reliability of Observations

Reliability was obtained by employing a second person to observe at randomly selected sessions throughout the course of the study. Reliability checks were obtained at least once per phase.

One commonly used statistic in interval recording has been the percentage agreement formula (Harris & Lahey, 1978). In this formula, the number of intervals during which the observers agree on occurrences and nonoccurrences of a behaviour is divided by the total number of observational intervals and the quotient is then multiplied by 100. This percentage agreement formula is susceptible to misinterpretation due to chance agreements when the observed behaviour occurs either very frequently or infrequently. For example, if in 100 observation intervals one observer recorded two occurrences of a behaviour at the beginning of the session and the second observer recorded two occurrences at the end of the session, the percentage agreement would be 96%, although the observing did not once agree on the occurrence of the behaviour. The reliability is

high due to agreement on the large number of non-occurrences of the behaviour.

Since initially low teacher praise rates were anticipated, the percentage agreement score would have likely provided inflated agreement. The Harris and Lahey (1978) formula was adopted, since it involves calculating separate occurrence and nonoccurrence percentages of agreement, with weight assigned to each measure according to the observed rate of the behaviour. Hence, the formula is designed to reduce distortion encountered with very low or high rates of behaviour.

As specified in the Harris and Lahey (1976) formula, occurrence and nonoccurrence agreement was first calculated for teacher praise rate by dividing the number of intervals in which observers both agreed that a praise occurred (or did not occur in the case of nonoccurrence agreement) by the total number of intervals. Observers were considered to agree if a praise statement was scored in either the same interval or an immediately preceding or following interval. Allowing one interval's deviation is consistent with the procedure of Van Houten and Sullivan (1975). Reliability was calculated by multiplying the occurrence agreement score by the mean proportion of unscored intervals averaged over the two independent observers and



adding the product to the nonoccurrence agreement score multiplied by the mean proportion of scored intervals averaged over the two independent observers. The result was then multiplied by 100 to yield a percentage.

Separate reliabilities for recipient and type of praise were calculated by dividing the number of agreements on the occurrence of praise for a recipient (or type) of praise by the number of agreements plus disagreements. The outcome was then converted to a percentage by multiplying by 100. A disagreement for recipient (or type) of praise was recorded under two circumstances: (a) if the observers both recorded a praise statement but disagreed on the recipient (or type); (b) if one observer recorded a praise statement for a particular interval, but the second observer recorded no praise. This method is a conservative one, since reliability will be lowered by disagreement about whether a praise statement occurred or not.

For child behaviour, reliability was calculated by dividing the number of agreements for the occurrence of a behaviour by the total number of observations and multiplying by 100 to yield a percentage.

### Procedure

While it was planned that the number of days in each of five phases would be approximately equal, this was not possible. The experimenter was allotted a limited amount of time within the school system to complete the project. On several occasions, the teacher missed one or more weeks of school due to illness. The number of days in latter phases had to be adjusted accordingly. As a result, the phases contained 13, 15, 10, 7 and 8 days respectively. Prior to introducing a new condition, the graphs for teacher praise rate and percentage of praise directed to the consistently low on-task children were visually inspected for trends which might interfere with data interpretation. With numerous graphs being monitored for teacher and child behaviour, it might not have been feasible to have all graphs stable before introducing new phases. Teacher behaviour received priority because it was the primary concern of the study.

#### I. Baseline (A)

The teacher was aware that a psychology student was present to observe the children and general classroom procedures. She was told that the observer was interested in implementing some procedure which would



increase on-task behaviour in the classroom. The teacher did not know that the observer was noting her rate of praise.

During baseline, classroom proceedings were conducted as usual. Following the baseline phase, the children were divided into high, medium and low on-task groups. The class was divided into groups based on a rank ordering of the percentage of time that each child spent on-task during the baseline condition. The third of the class who were most on-task became the high on-task group, the middle third became the medium on-task group and the remaining third of the class became the low on-task group. The number of children placed in each on-task group and the range of on-task behaviour exhibited by each group were as follows:

	<u>% On-Task</u>	<u>N</u>
High On-Task	92.1% - 98.9%	12
Medium On-Task	82.9% - 90.7%	12
Low On-Task	66.4% - 82.2%	13

## II. Audio Cueing 1 (B)

Audio cues were first introduced during audio cueing 1 and remained in effect during the remainder of the study. In this and subsequent phases, audio cues were presented at a rate of 30 cues per hour.

On the last baseline day, the audio cueing system was explained to the teacher. The principle of positive reinforcement was reviewed, and examples from the literature on classroom applications of praise were discussed. The rationale provided to the teacher for audio cueing was that it would help her to remember to praise and would assist her in spreading praise throughout the entire instructional period. It was explained that when she heard the cue, she should look up and praise a child who was on-task, using both the child's name and a description of the child's behaviour. That there would always be at least one child worthy of praise was stressed. It was also made explicit that the teacher did not have to restrict praise only to times when she heard the cue, but she was free to give additional praise at any time. (See Appendix B for the precise instructions given to the teacher.) The teacher was handed a sheet containing a definition of praise and a description of the behaviours to be praised (see Appendix C). She then practised operating the microcassette recorder and providing examples of praise.

Because the teacher was absent for a week, the instructions were repeated prior to the first audio cueing session. The teacher explained to the students



that she would be carrying a microcassette recorder to help the observer with a project she was doing for the university. The students were informed that the microcassette recorder would be giving the teacher instructions to carry out.

After about 2 days of audio cueing, the teacher requested help with incorporating behavioural descriptions into classroom activities. Ways to do this were discussed, and a sheet with further examples was composed and presented to the teacher (see Appendix D).

Initially, the teacher had problems with giving praise and tended to speak in a lowered voice, omit the child's name or describe a behaviour without adding a praise statement. Following the first reliability check, the primary observer met with the teacher to gently stress the importance of making the praise audible. The primary observer pointed out to the teacher that by clearly specifying to whom a praise statement was directed and for what reason, the recipient of a praise statement could serve as a model for the rest of the class. In cases in which two or three children had the same first name, the teacher decided to address the children by their first and last names or by nicknames in order to distinguish among these children. For about 5 days, the teacher was given informal feedback by the

observer on the degree to which she spoke loudly and distinctly and provided the child's name and behaviour. The feedback was given by means of a brief note at the end of the session.

The addendum on defining praise was introduced during audio cueing 1 following several poor reliability checks.

At the end of audio cueing 1, the children were once more rank ordered on the percentage of on-task behaviour emitted over the entire phase. Only eight of the previously labeled low on-task children were re-categorized as low on-task.

### III. Audio Cueing Plus 'Focus Praise Package' (BC)

Instructions for the third phase were provided on the final day of audio cueing 1. Because the teacher was absent for one week, the instructions were repeated before the first audio cueing plus 'focus praise package' session. In this condition, the teacher was instructed to focus 67% of her praise on eight children designated by the experimenter. The teacher was not told that these children had been rated as low on-task during both the baseline and audio cueing 1 conditions. She was told that these children had not improved as much as the others. (See Appendix E for the precise instructions



given to the teacher). These eight children will be referred to as the consistently low on-task group to distinguish them from the group categorized as low on-task during baseline.

The criterion amount of praise to be directed to the consistently low on-task children was an arbitrary figure. However, three considerations guided the selection of the 67% criteria: (a) that the criterion amount of praise directed towards the consistently low on-task children should be higher than the baseline level; (b) that the consistently low on-task children should be receiving more praise than the remainder of the children and (c) that the remaining children should receive some praise to help maintain their on-task behaviour.

In the audio cueing plus 'focus praise package' condition, instructions, feedback and praise were relayed by means of a written note handed to the teacher at the end of each mathematics session. The note contained the percentage of praise directed to the targeted children, instructions to increase (if below the 67% praise criterion for the consistently low on-task children) or maintain the current percentage of praise directed to the targeted children, as well as praise statements directed

towards the teacher when the criterion praise distribution was met or surpassed. The teacher continued to be cued at a rate of 30 praises per hour.

To ensure that the teacher remembered which children she had to praise, she was asked to keep a class list constructed by the observer on the top of her desk. The targeted children were the first eight on the list. The teacher also completed a daily checklist of the eight consistently low on-task children that she recalled having praised during the mathematics class. This was done to prompt her to review the names.

#### IV. Audio Cueing 2 (B)

In this phase, the teacher was instructed that she would no longer be provided with instructions, feedback and praise with regard to which children she praised. It was stressed that she could decide for herself who would be provided with praise. (See Appendix F for the precise instructions given to the teacher.) Cues continued to be provided at a rate of 30 cues per hour.

#### V. Audio Cueing Plus 'Increase Praise Package' (BD)

As well as being presented with audio cues, the teacher was given instructions, feedback and praise with



regard to her observed praise rate.<sup>6</sup> The teacher was instructed to praise at a rate of 30 praises per hour, or each time she heard the audio cue. (See Appendix G for the exact instructions given to the teacher.) The teacher was given a note containing her observed praise rate at the end of the session. The note also contained instructions to increase the praise rate if the observed praise rate was below 30 praises per hour, or to maintain the current praise rate. A praise statement from the observer was included if the teacher had improved from her previous day's praise rate. This package is different from the previous instructions, feedback and praise package in that it is directed towards increasing the teacher's praise rate rather than altering her distribution of praise.

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<sup>6</sup>It was originally planned that the 'focus praise package' would be implemented in this phase. However, because of the teacher's lowered praise rate, a new package directed towards increasing the teacher's praise rate was introduced.

## Results

### Reliability

The reliability coefficients for the teacher's praise rate are presented in Table 1. Because the reliability coefficients for praise rate, recipient of praise and type of praise were not consistently acceptable<sup>7</sup> in the initial audio cueing phase until after day 21, the praise data for sessions 14 to 21 were dropped from all subsequent analyses. Without these days, the mean reliability for teacher praise rate was 93.2%, while the median was 96.2%.

Reliabilities for praise rate ranged from 83.3% to 100.0%.

For both recipient and type of praise, the means, medians and ranges of reliability were based only on days used in subsequent analyses. For recipient of

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<sup>7</sup>Kazdin (1980) suggests that 80% agreement is generally considered an acceptable level of reliability. The extreme drop in reliability to 50% agreement for some categories of teacher behaviour at the beginning of audio cueing 1 indicated that the observers were doing little better than guessing at what teacher behaviours were occurring. Procedures designed to enhance reliability were then introduced (see Appendix H). While only one reliability check was planned, additional checks were made during audio cueing 1 until one reliability check indicated high levels of agreement for categories of teacher behaviour (88.2% to 100.0%). A further check was made to ensure that the high level of reliability was maintained during the rest of the condition. This latter check indicated acceptable levels of reliability.



Table 1Reliabilities for teacher praise rate

<u>Phase</u>	<u>Observation Day</u>	<u>Reliability</u>
Baseline	1	83.3%
Audio Cueing 1	16	60.8%
	17	56.1%
	19	81.0%
	20	76.2%
	22	100.0%
	26	92.3%
Audio Cueing Plus 'Focus Praise Package'	32	100.0%
Audio Cueing 2	39	83.8%
Audio Cueing Plus 'Increase Praise Package'	51	100.0%

praise, the reliability had a mean of 90.3% and ranged from 83.3% to 100.0%. The median was 87.6%. The reliability for type of praise ranged from 66.7% to 100.0% with a median of 80.8% and a mean of 81.1%. See Table 2 for recipient and type of praise reliabilities.

Reliability coefficients for child behaviour are given in Table 3. The mean reliability for child behaviour was 93.2% with a range of 86.8% to 98.2%. The median was 93.5%.

#### Teacher Praise Rate

One concern of the present study was the effect of audio cueing on the rate of teacher praise. Daily praise rates are plotted in Figure 1.

During baseline, the mean praise rate was 2.4 per 60 minutes.<sup>8</sup> This praise rate increased to a mean of 34.1 praises per 60 minutes during audio cueing 1, and dropped slightly to a mean of 28.7 praises per 60 minutes when the 'focus praise package' was added to the audio cueing system. During audio cueing 2, the teacher's praise rate decreased dramatically to a mean of 9.8

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<sup>8</sup>Since unreliable data were obtained when audio cueing was first introduced, the accuracy of the baseline data might be questioned. An argument for the accuracy of these data can be found in Appendix H, "Problems in Conducting the Study."



Table 2Reliabilities for recipient of praiseand type of praise

<u>Phase</u>	<u>Observation Day</u>	<u>Reliabilities</u>	
		<u>Recipient</u>	<u>Type</u>
Baseline	1	83.3%	83.3%
Audio Cueing 1	16	50.0%	52.3%
	17	52.9%	47.1%
	19	71.4%	60.7%
	20	50.0%	62.5%
	22	88.2%	88.2%
Audio Cueing 2	26	87.0%	78.3%
	32	100.0%	70.0%
Audio Cueing Plus 'Focus Praise Package'	32	100.0%	70.0%
Audio Cueing 2	39	83.3%	66.7%
Audio Cueing Plus 'Increase Praise Package'	51	100.0%	100.0%

Table 3Reliabilities for child behaviour

<u>Phase</u>	<u>Observation Day</u>	<u>Reliability</u>
Baseline	1	91.5%
Audio Cueing 1	16	95.4%
	26	91.6%
Audio Cueing Plus 'Focus Praise Package'	32	86.8%
Audio Cueing 2	39	95.8%
Audio Cueing Plus 'Increase Praise Package'	51	98.2%



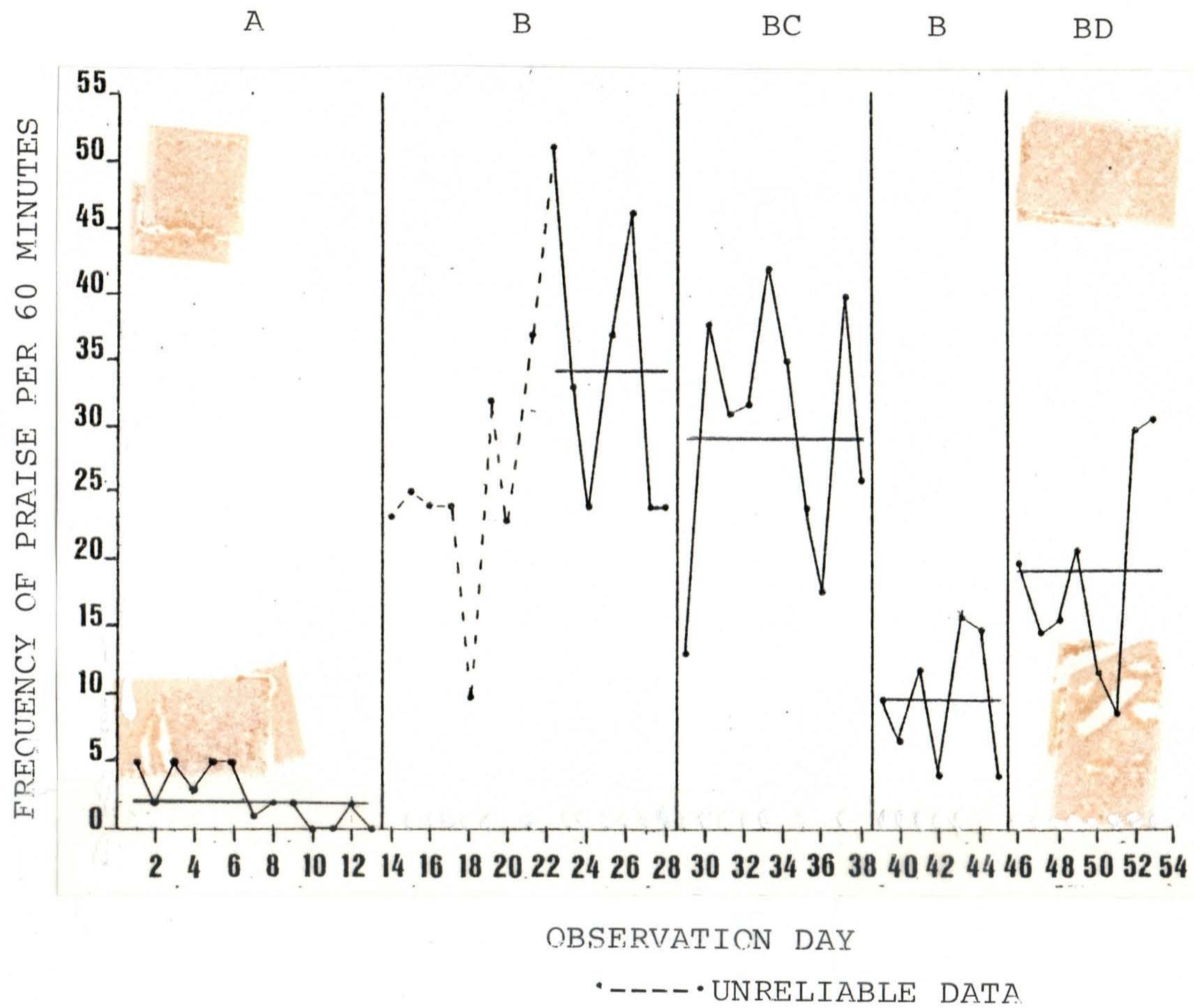


Figure 1. Daily rate of teacher praise per 60 minutes. The horizontal line represents the mean for each phase. (A = baseline; B = audio cueing; C = 'focus praise package'; D = 'increase praise package'.)

praises per 60 minutes in spite of the presentation of audio cues at 30 cues per hour. Thus, while the effect of audio cues was to increase the rate of praise over the baseline level during all audio cueing conditions, the teacher's praise rate fell considerably below the cued rate during audio cueing 2.

Another concern of the present investigation was the effect of adding to the audio cueing system an 'increase praise package' once the teacher's praise rate had dropped. The teacher's praise rate increased from a rate of 9.8 praises per 60 minutes during audio cueing 2 to 19.3 praises per 60 minutes during the audio cueing plus 'increase praise package' condition. The addition to the audio cueing system of instructions to increase the praise rate, feedback and experimenter praise for improved teacher praise rates appears to have increased the teacher's praise rate.

#### Recipient of Praise

The primary research issues in this study were related to determining (a) how the teacher would distribute her praise among high, medium and low on-task groups when audio cueing was first introduced and (b) the effect of the 'focus praise package' for altering the teacher's distribution of praise.



Since praises were coded as to which child received the praise, it was possible to determine for each day the percentage of praise directed towards the high, medium and low on-task children. These data served as the dependent variable in one way analyses of variance to determine differences in the percentage of praise received by the high, medium and low on-task groups in each condition. Four separate analyses of variance rather than one combined analysis of variance were performed because of the demands of the study. After audio cueing 1, it was necessary to know how the teacher distributed her praise among the high, medium and low on-task groups. This information was used to determine which children the teacher was instructed to focus upon in the 'focus praise package' condition. An analysis of variance on the recipient of praise was also advisable after the audio cueing plus 'focus praise package' condition, to confirm that the 'focus praise package' did increase praise to the targeted group. To be consistent, the remaining phases were analyzed separately.

A one-way analysis of variance indicated that during audio cueing 1, there was no significant difference in the amount of praise received by the high, medium

and low on-task groups,  $F(2, 18) = 2.12, p > .05$ . Hence, when audio cueing was first introduced, the teacher distributed her praise evenly among the high, medium and low on-task groups.

Analysis of variance on the remaining phases indicated no significant differences in recipient of praise for audio cueing 2,  $F(2, 18) = .90, p > .05$  or the audio cueing plus 'increase praise package' condition,  $F(2, 21) = .98, p > .05$ . However, a significant difference in the recipient of praise was found in the audio cueing plus 'focus praise package' condition,  $F(2, 27) = 102.2, p < .01$ . A comparison of means using the Tukey Honestly Significant Difference Test suggested that the low on-task group received significantly more praise than the high and medium on-task groups during the audio cueing plus 'focus praise package' condition ( $p < .01$ ), while the high and medium on-task groups did not differ from each other in the amount of praise received ( $p < .05$ ).

Praise was distributed evenly among the three on-task groups in all audio conditions except the audio cueing plus 'focus praise package' condition. In the latter condition, the low on-task children received significantly more praise than the remaining children. These findings tend to suggest that the 'focus praise package' changed the teacher's distribution of praise.



To further support the efficacy of the 'focus praise package,' the daily percentage of praise received by the consistently low on-task group is graphed in Figure 2. During audio cueing 1, the consistently low on-task group received 25.7% of the praise. The percentage of praise directed to this group increased to 67.3% during the audio cueing plus 'focus praise package' condition. While praise directed towards this group decreased to 5.7% during audio cueing 2 with the removal of the 'focus praise package,' the teacher's praise rate was also extremely low. Differences between audio cueing 2 and other phases could be related to the lowered praise rate. However, when the teacher's praise rate was increased during the audio cueing plus 'increase praise package' condition, the consistently low on-task children received 19.4% of the praise.

Hence, there was a substantial increase in the percentage of praise received by the consistently low on-task group with the presentation of the 'focus praise package' and a subsequent decrease when the package was withdrawn in a comparable praise rate condition. This finding further suggests that if, in addition to audio cues for praise, there is presented instructions to focus the praise, feedback and experimenter

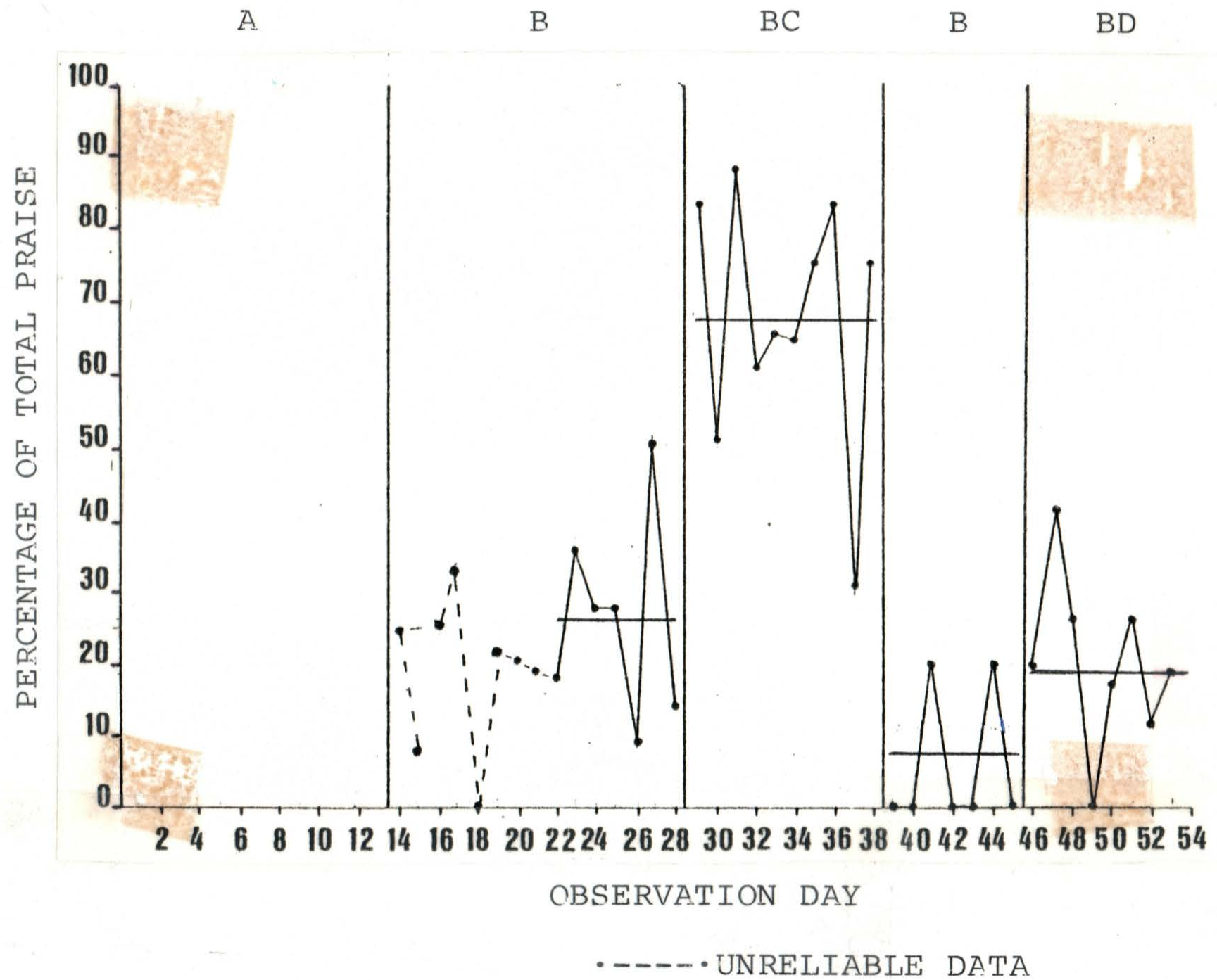


Figure 2. Daily percentage of praise directed to the eight consistently low on-task children. The horizontal line represents the mean for each phase. (A = baseline; B = audio cueing; C = 'focus praise package'; D = 'increase praise package'.) No baseline data is presented due to the low frequency of praise during baseline.



praise for meeting or surpassing a criterion praise distribution, then there is a corresponding change in the distribution of praise by the teacher.

#### Type of Praise

The type of praise given by the teacher was monitored in order to determine whether the teacher did praise those behaviours defined as on-task. The percentage of academic, social and neutral praise emitted by the teacher in each phase is presented in Table 4.

The mean percentages of each type of praise for all audio cueing conditions combined were 25.2% for academic praise, 72.3% for social praise and 2.5% for neutral praise. In all conditions, more social than academic and neutral praise was delivered. Since social praise represents praise given for on-task behaviour, the teacher did mostly praise for on-task behaviour.

#### Child Behaviour - Class Data

The effect of increased praise rates during audio cueing on class on-task behaviour was explored in this study. A comparison of the amount of class on-task behaviour occurring under an equal distribution of praise and under a distribution of praise in which 67% of the praise was directed towards a consistently low on-task

Table 4

Percentage of academic, social and neutral praise for  
each audio cueing phase

<u>Condition</u>	<u>Academic</u>	<u>Social</u>	<u>Neutral</u>
Audio Cueing 1	36.8%	59.8%	3.4%
Audio Cueing Plus 'Focus Praise Package'	19.6%	77.5%	2.9%
Audio Cueing 2	20.0%	80.0%	0.0%
Audio Cueing Plus 'Increase Praise Package'	24.5%	71.7%	3.8%



group was also made. A graph of on-task behaviour for the class is presented in Figure 3.

Prior to any data presentation or analysis for on-task behaviour, one child from the consistently low on-task group was dropped. This child was omitted due to his absence for 7 out of 10 days in which the consistently low on-task group received most of the praise. None of the other children in the consistently low on-task group were absent for more than 3 of the 10 days. Percentages of on-task behaviour for each of the high, medium and low on-task subgroups were calculated by dividing the number of on-task intervals for a particular subgroup by the total number of observations for that subgroup. Class data were based on the daily average of the percentage of on-task behaviour for the high, medium and low on-task groups.

The graph of class on-task behaviour indicates that the mean on-task behaviour during baseline was 85.2%. Over the following four phases, on-task behaviour increased slightly for each successive condition to 89.2%, 91.3%, 92.2% and 94.2% respectively. These data appear to suggest that the effect of increased praise rates during audio cueing conditions was to increase class on-task behaviour. However, it is not clear from visual inspection of the graph during what conditions

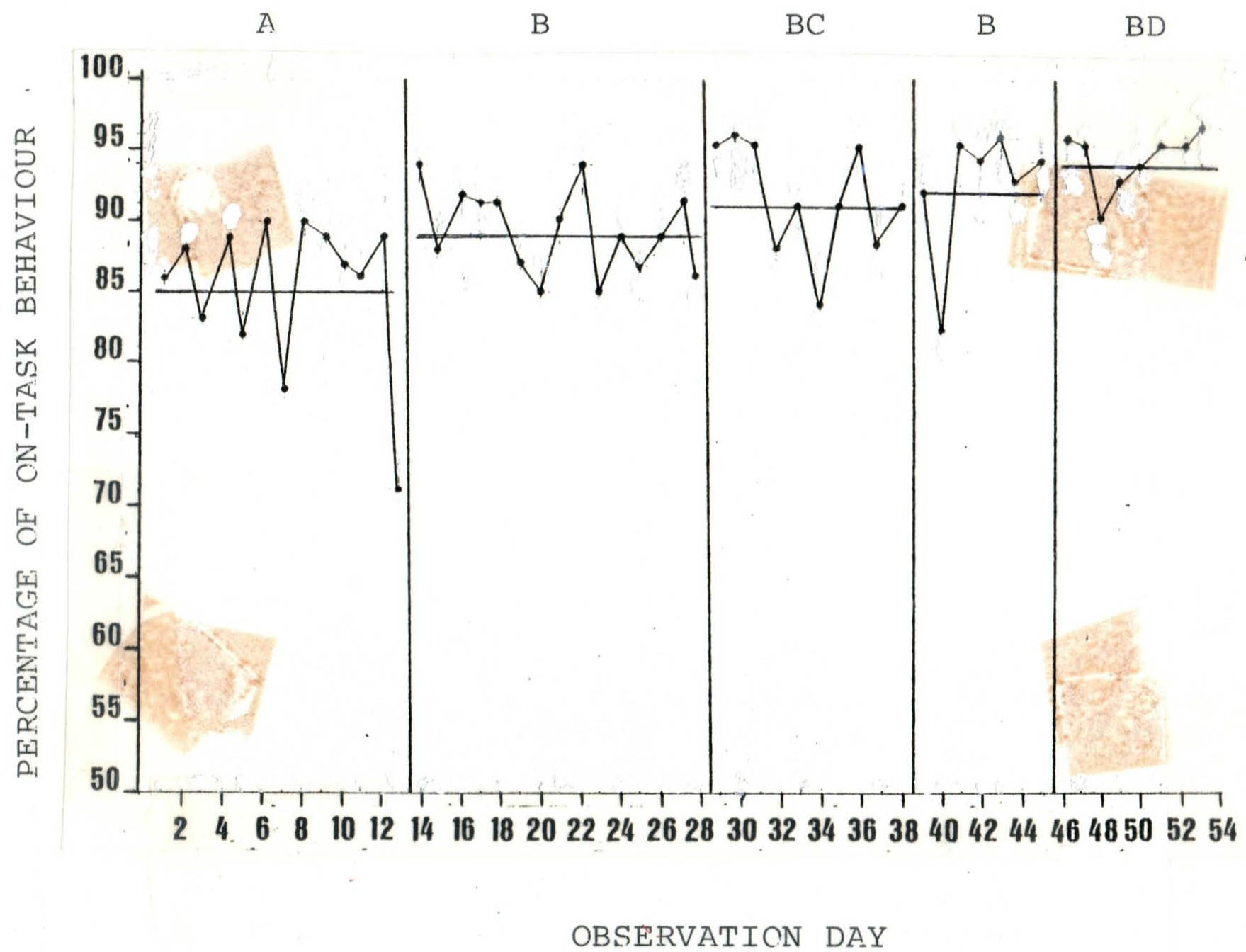


Figure 3. Percentage of on-task behaviour for the class. The horizontal line represents the mean for each phase. (A = baseline; B = audio cueing; C = 'focus praise package'; D = 'increase praise package'.)



the increased level of class on-task behaviour became significantly different from the baseline level.

To assist in determining differences in on-task levels among phases, a two way analysis of variance for on-task group by treatment was conducted. The percentage of on-task behaviour for each child within each phase was used as the dependent variable.<sup>9</sup> Percentages of on-task observations rather than total numbers were calculated for several reasons. Within each phase, children were observed an unequal number of times due to absenteeism. Differing numbers of observations were obtained on the same child from one phase to the next due to: (a) unequal numbers of days in each phase and (b) reducing the number of observations per child following day 21 by alternating child and teacher observations.

Analysis of variance indicated significant effects for on-task group,  $F(2, 33) = 17.4, p < .01$ , treatment,  $F(4, 132) = 12.3, p < .01$  and the on-task group by treatment interaction,  $F(8, 132) = 3.76, p < .01$ . The Tukey Honestly Significant Difference Test was used to further analyze significant main effects and interactions.

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<sup>9</sup>The percentages of on-task behaviour for each child within each phase are presented in Appendix I for those readers who may wish to compare the performance of individual children to group trends.

Post hoc analysis for the main effect of treatment indicated that increases in on-task behaviour approached significance over the baseline level during audio cueing 1 ( $p = .053$ ). The audio cueing plus 'focus praise package' condition was significantly different from baseline ( $p < .01$ ) as were the subsequent audio cueing conditions ( $p < .01$ ). The audio cueing plus 'increase praise package' condition led to more on-task behaviour than did audio cueing 1 ( $p < .01$ ). The analysis of variance data also appears to suggest that increased praise rates during audio cueing increased class on-task behaviour. However, the analysis of variance suggests that the increase in class on-task behaviour was not significant until the audio cueing plus 'focus praise package' condition.

With regard to comparing on-task behaviour under the two distributions of praise, inspection of the graph suggests that there is no systematic increase and decrease in on-task behaviour with the introduction and removal of the 'focus praise package'. As was cited earlier, on-task behaviour increased consistently over phases. The analysis of variance also indicated no significant difference between the audio cueing plus 'focus praise package' condition and audio cueing 1 with its equal



distribution of praise. These findings suggest that there was no difference in increasing class on-task behaviour between an equal distribution of praise and a distribution in which 67% of the praise was directed to a group of consistently low on-task children.

One finding which might suggest the superiority of directing 67% of the praise to the consistently low on-task children is that the increase in class on-task behaviour was not significant until the audio cueing plus 'focus praise package' condition. However, the increase may be significant due to additional days of audio cueing rather than the altered distribution per se.

#### Child Behaviour - High, Medium and Low On-Task Groups

In order to explore any differential effects of an increased praise rate and altered distribution of praise on the high, medium and low on-task children, the on-task data for each of the three groups will be considered. A graph of the daily percentage of on-task behaviour for the three on-task groups can be found in Figure 4. The mean percentages of on-task behaviour for each group within each treatment were as follows:

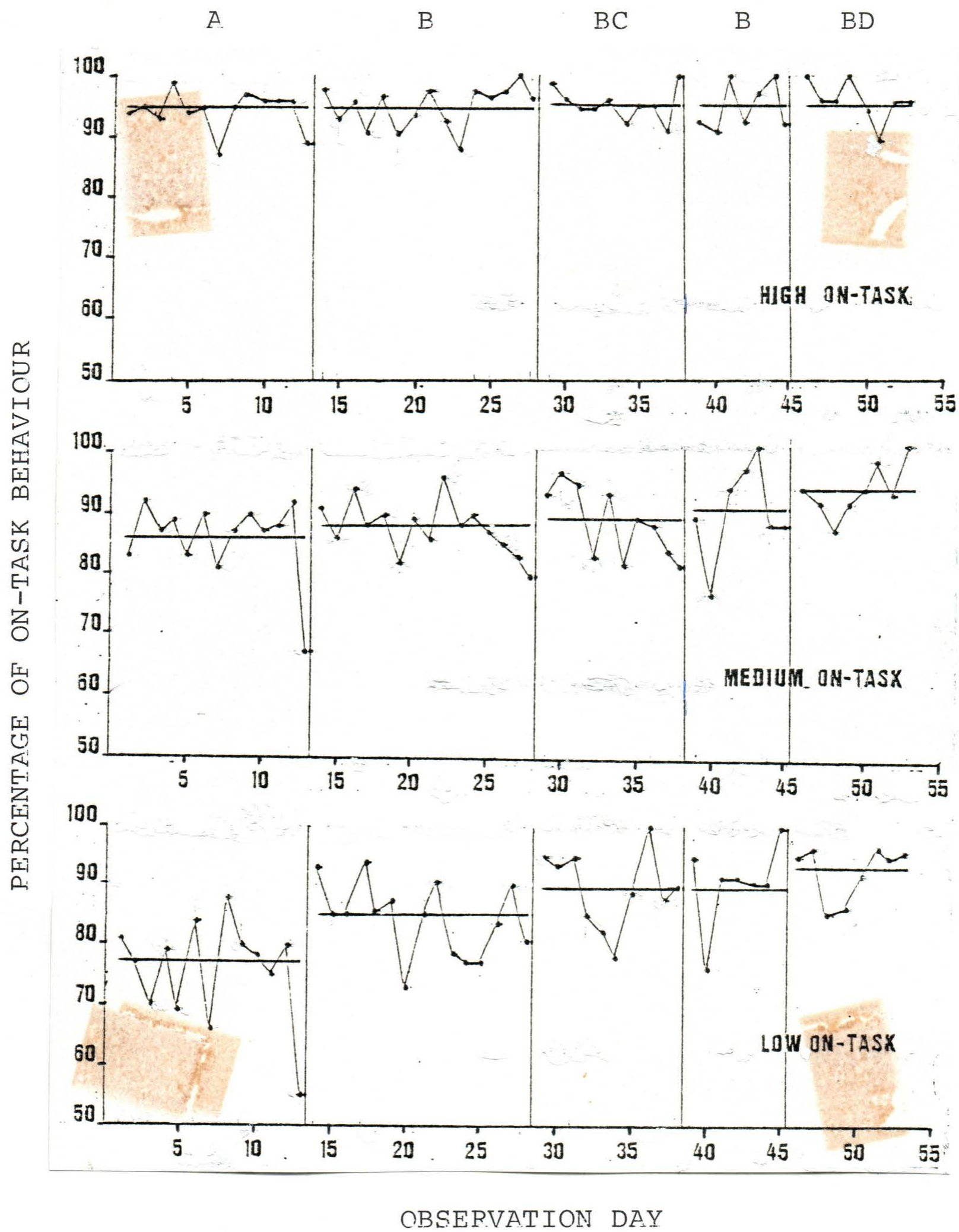


Figure 4. Percentage of on-task behaviour for the high, medium and low on-task groups. The horizontal line represents the mean for each phase. (A = baseline; B = audio cueing; C = 'focus praise package'; D = 'increase praise package'.)



	<u>High On-Task</u>	<u>Medium On-Task</u>	<u>Low On-Task</u>
Baseline	94.6%	86.3%	76.9%
Audio Cueing 1	95.3%	87.9%	84.9%
Audio Cueing Plus 'Focus Praise Package'	96.1%	88.5%	89.7%
Audio Cueing 2	95.6%	90.8%	90.4%
Audio Cueing Plus 'Increase Praise Package'	96.2%	94.2%	92.7%

There tends to be slight increases in on-task behaviour from phase to phase for the high, medium and low on-task groups, although the increases for the high on-task group are minimal.

As was already stated, analysis of variance on on-task behaviour indicated significant effects for on-task group,  $F(2,33) = 17.4$ ,  $p < .01$ , treatment,  $F(4, 132) = 12.3$ ,  $p < .01$  and the on-task group by treatment interaction,  $F(8, 132) = 3.76$ ,  $p < .01$ . The Tukey Honestly Significant Difference Test was used to further analyze significant main effects and interactions.

Comparison of means for the main effect of on-task group indicated that the high on-task group performed significantly better than the low and medium on-task groups ( $p < .01$ ), while the medium and low on-task groups did not differ from each other ( $p > .05$ ).

The first series of differences among means tests for the interaction was conducted by comparing the high,

medium and low on-task group means for each level of the treatment. While the three on-task groups begin as significantly different during baseline ( $p < .01$ ), differences between the medium and low on-task groups disappeared during audio cueing 1 ( $p > .05$ ). By audio cueing 2, there were no longer significant differences among any of the three on-task groups ( $p > .05$ ). While the high, medium and low on-task groups were initially different, by the end of the treatment conditions the low and medium on-task groups were displaying as much on-task behaviour as the high on-task group. These findings support the effectiveness of increased praise rates and/or an altered distribution of praise for increasing child on-task behaviour.

The second series of differences among means tests for the interaction was conducted by comparing treatment means within each on-task group. No treatment had any effect on the high on-task group ( $p > .05$ ). For the medium on-task group, audio cueing 2 and the audio cueing plus 'increase praise package' condition resulted in significantly higher levels of on-task behaviour compared to the baseline condition ( $p < .01$ ). Audio cueing plus the 'increase praise package' condition led to significantly more on-task behaviour than baseline audio



cueing 1 or the audio cueing plus the 'focus praise package' condition for the medium on-task group ( $p < .01$ ). For the low on-task group, all treatments resulted in improvement over baseline levels of on-task behaviour ( $p < .01$ ). The audio cueing plus 'focus praise package' condition, audio cueing 2 and the audio cueing plus 'increase praise package' condition were also more effective for the low on-task group than audio cueing 1 ( $p < .01$ ). It appears that the high, medium and low on-task children were differentially affected by the treatment conditions.

#### Child Behaviour - Consistently Low On-Task Group

Since the seven consistently low on-task children received 67% of the praise during the audio cueing plus 'focus praise package' condition, the data for their on-task behaviour are presented separately in Figure 5. During baseline, the mean amount of on-task behaviour exhibited by this group was 74.7%. The level of on-task behaviour rose to 79.3% during audio cueing 1. Further gains were observed when the teacher maintained her praise rate but focused 67% of her praise on this group during the audio cueing plus 'focus praise package' condition, with on-task behaviour occurring 88.2% of the time. This same level of on-task behaviour (88.2%)

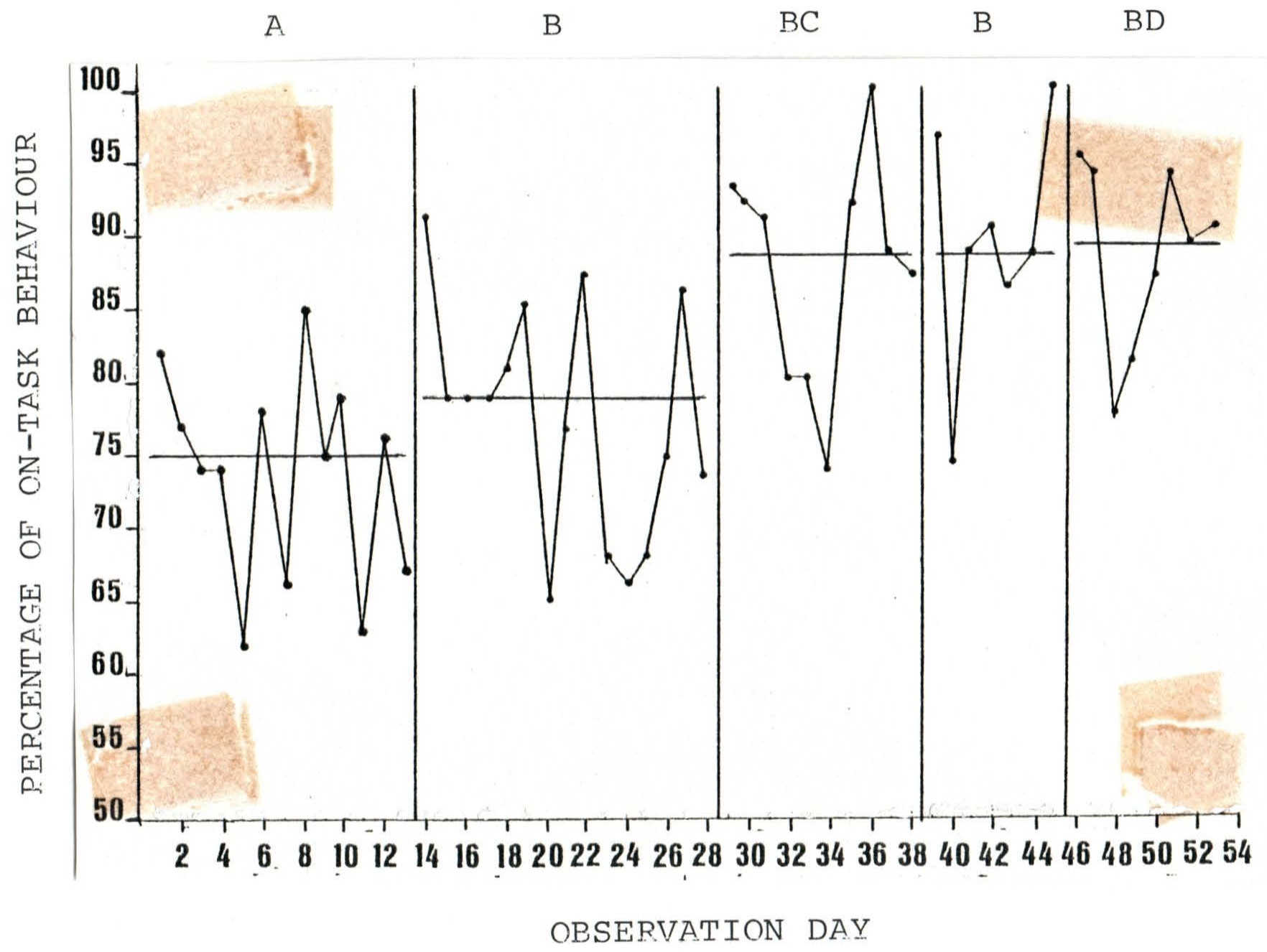


Figure 5. Percentage of on-task behaviour for the consistently low on-task group. The horizontal line represents the mean for each phase. (A = baseline; B = audio cueing; C = 'focus praise package'; D = 'increase praise package'.)



was maintained when the teacher's praise rate decreased during audio cueing 2. In the audio cueing plus 'increase praise package' condition, the consistently low on-task children engaged in on-task behaviour 88.8% of the time.

A one-way analysis of variance was performed on the data for the consistently low on-task children. The treatment effect was significant,  $F(4, 24) = 5.7$ ,  $p < .01$ . The Tukey Honestly Significant Difference Test indicated that this group first improved significantly over the baseline level during the audio cueing plus 'focus praise package' condition, ( $p < .05$ ). These gains were maintained both when the teacher's praise rate fell drastically during audio cueing 2 ( $p < .05$ ) and when these children were no longer the recipients of most of the praise in the audio cueing plus 'increase praise package' condition ( $p < .01$ ).

Both visual inspection of the graph and analysis of variance indicated that the consistently low on-task children did not increase their on-task levels under an equal distribution of praise. It was not until these children received 67% of the praise that a significant increase in on-task behaviour was observed. Once the level of on-task behaviour was raised during the audio

cueing plus 'focus praise package' condition, the increased level of on-task behaviour was maintained in latter conditions.



## Discussion

### Teacher Praise Rate

The results of this study tend to indicate that audio cueing increased the rate of teacher praise. This hypothesis, however, was tested with the weak A-B time-series design. Since the rate of teacher praise was decreasing during baseline, it is unlikely that the increased praise rate during audio cueing represents the natural course of the behaviour.

Furthermore, it seems unlikely that an event correlated with the introduction of audio cueing led to the increase in the teacher's praise rate. Variables which might occur naturally in the environment such as instructions and modeling are generally ineffective in increasing teacher praise rates (e.g. Parsonson et al., 1974; Ringer, 1973). The teacher's praise rate increased from 2.4 praises per 60 minutes during baseline to 34.1 praises per 60 minutes during audio cueing 1. It seems unlikely that some fortuitous event would have resulted in a praise rate fourteen times higher than the baseline level.

The effectiveness of audio cueing for increasing the rate of teacher praise has been experimentally demonstrated (Noseworthy Spencer, 1977; Van Houten &

Sullivan, 1975). While it is most probable that audio cueing increased the rate of teacher praise in this study, the effect of correlated variables was not experimentally ruled out.

One unexpected finding was the sudden drop in the teacher's praise rate to a level considerably below the cued rate during audio cueing 2. This finding is significant in itself. Previous audio cueing studies (Noseworthy Spencer, 1977; Van Houten and Sullivan, 1975) reported relatively stable praise rates once an audio cueing system had been introduced, with average teacher praise rates matching or surpassing the cued rate. Both Noseworthy Spencer (1977) and Van Houten and Sullivan (1975) suggested that audio cueing may be effective in the absence of an observer. This study would suggest that the monitoring of an audio cueing system is needed to ensure that teachers praise when cued. If teachers ignore the cues, then additional procedures may be required to reinstate high praise levels.

Variables which might account for the sudden drop in the teacher's praise rate can be considered. When questioned following audio cueing 2, the teacher revealed that she wanted to know if the class would behave well if she gave less praise. The teacher decided to decrease her praise rate without consulting the experimenter.



The teacher stated that she believed the experimenter would inform her if her performance were unsatisfactory. The provision of instructions, feedback and praise concerning some aspects of the teacher's behaviour may have led to the expectation that the observer would intervene if the teacher did not meet adequate performance standards. When no intervention followed, the teacher assumed that her lowered praise rate was acceptable.

The teacher also stated that the children (a) should not need high rates of praise in order for them to behave appropriately and (b) might think she was behaving strangely because she was praising frequently. When the teacher praised, she may have told herself that the children might think she was behaving in a peculiar manner or that the children did not need praise. These self-statements may have punished the teacher's praise statements, contributing to the decline in the teacher's praise rate.

Another interesting observation involves how the teacher utilized the sound to cue praise. The teacher stated that the cue often occurred when it was inappropriate to provide praise, such as when the teacher was in the middle of speaking a sentence. Although the teacher agreed to praise as soon after the sound as

possible, she repeatedly reported saving praise for a later time.

The finding of lowered praise rates within the audio cueing system leads to the question of what could be done to maintain high praise rates. One possibility would be to provide feedback and praise for complying with the demands of an audio cueing system when the system is first introduced, then to gradually fade out the feedback and praise. Since there were indications that the teacher felt uncomfortable with giving praise, failure to give praise might be viewed as an assertiveness problem for some teachers. A workshop held prior to the initiation of an audio cueing system in which giving praise in the classroom was modeled, practised and reinforced might help to ensure that teachers praise when cued. Broader issues in assertion training (e.g. Lange & Jakubowski, 1976) could be included in such a workshop.

When the teacher's praise rate dropped during audio cueing 2, an opportunity was provided to test the effect of adding an 'increase praise package' on the teacher's praise rate. The teacher's praise rate increased from 9.8 praises per 60 minutes during audio cueing 2 to 19.3 praises per 60 minutes in the audio



cueing plus 'increase praise package' condition. This finding tends to suggest that if, in addition to audio cues for praise, there are presented instructions to increase the praise rate, feedback and experimenter praise for an improved teacher praise rate, then there is an increase in the teacher's praise rate.

However, the effect of the addition to the audio cueing system of the 'increase praise package' was tested with the weak A-B time-series design. Since there is no increasing trend in teacher praise rate during audio cueing 2, it is unlikely that the observed changes would have occurred with the passage of time. The difficulty in changing teacher praise rates through means which might occur naturally in the environment (e.g. instructions, modeling) has already been discussed. While it is unlikely that some event correlated with the addition of the 'increase praise package' increased the teacher's praise rate, this possibility was not experimentally ruled out.

The audio cueing plus 'increase praise package' condition ended just as the teacher was beginning to show an additional increase in her praise rate. If this phase had been extended, higher rates of praise may

have been attained. Unfortunately, it was not possible to continue this condition or collect follow-up data due to time constraints.

#### Distribution of Praise

One of the primary concerns of this study was to determine how the teacher would distribute her praise among the high, medium and low on-task children when audio cueing was first introduced. During the audio cueing 1 condition, the teacher distributed her praise evenly among the three groups. Since only one teacher participated in this study, generalizations about how other teachers distribute praise can not be made and is left for future research to determine.

The second primary concern of this study was to determine the effect of the 'focus praise package' on the teacher's distribution of praise. The effect of this package was tested with an A-B-A time-series design. The percentage of praise directed to the consistently low on-task children increased from 25.7% during audio cueing 1 to 67.3% during the audio cueing plus 'focus praise package' condition, and decreased to 19.4% during the audio cueing plus 'increase praise package' condition. The systematic change in the percentage of praise directed to the consistently low



on-task children with the introduction and removal of the 'focus praise package' suggests that the package rather than some correlated event led to the change in the teacher's distribution of praise. This finding suggests that if, in addition to audio cues for praise, there is presented instructions to focus the distribution of praise, feedback and experimenter praise for meeting or surpassing a criterion distribution of praise, then there is a corresponding change in the distribution of praise by the teacher.

While an A-B-A-B time-series design was planned to test the effect of the 'focus praise package', this package was not reintroduced due to the teacher's low praise rate. The reintroduction of the 'focus praise package' would have provided another opportunity to observe the effect of the treatment on the distribution of praise, thus adding further support for the treatment's effectiveness. However, the A-B-A time-series design is adequate for an experimental test of a treatment's effect (Hersen & Barlow, 1976).

Since instructions, feedback and praise were effective in modifying the teacher's distribution of praise, this package might be useful for modifying other types of teacher-student interactions. Of

particular importance would be modifying those interactions in which a teacher demonstrates a bias towards a certain group of students. For example, Brophy and Good (1970) found that teachers ignored only 3% of the answers given by students they believed to be high achievers, while teachers ignored 15% of the answers given by students they believed to be low achievers. Instructions, feedback and praise might be used to equalize the number of teacher responses given to perceived high and low achievers.

#### Type of Praise

Information on type of praise was collected to confirm that the teacher complied with instructions to praise on-task behaviours. Since 72.3% of the praise given during the audio cueing phases was social, it may be concluded that the teacher primarily praised on-task behaviours.

#### Effect of Increased Praise Rates During Audio Cueing On Class On-Task Behaviour

The results of this study suggest that increased praise rates during audio cueing increased the amount of class on-task behaviour. However, there are several limitations involved in drawing this conclusion.



While the level of class on-task behaviour increased over baseline during all audio cueing conditions, analysis of variance indicated that audio cueing with its equal distribution of praise just missed significance at the .05 level. It was not until the audio cueing plus 'focus praise package' condition that class on-task behaviour showed a statistically significant increase at the .01 level of significance. While the increase in class on-task behaviour may have become significant in this phase due to the additional days of audio cueing, it is also possible that the increase is related to the alteration in the distribution of praise rather than the increased rate of praise per se.

The second limitation is related to the weak A-B time-series design. While there was no evidence of an increasing trend in class on-task behaviour during baseline, the possibility that one or more uncontrolled variables could have led to the observed change is problematic.

Some other variables which might be considered to be related to the gradual increase in class on-task behaviour from one phase to the next will be considered. These variables include: the introduction of a tape recorder with associated student expectations for better

performance; a longer time period for the teacher to manage the problem children as identified by the experimenter; student maturation and improved control of student behaviour due to factors other than praise (e.g. parent-teacher conferences).

The introduction of the tape recorder, however, is unlikely to have led to improved student performance. The students were told that the teacher was assisting the observer with a university project and that the tape recorder was giving her instructions to carry out. Thus, as far as the children were concerned, the purpose of the tape recorder was to change the teacher's behaviour.

Improvement in child behaviour is also unlikely to be due to a longer time period for the teacher to manage problem children as identified by the experimenter with methods other than praise. The teacher was not informed of the targeted children's low on-task status. Informal conversations with the teacher suggested she believed that some of the targeted children were well behaved. This inaccurate perception may have been due to the teacher's inability to see what the low on-task children seated at the back of the room were doing. Since the teacher was unaware of the targeted children's on-task status, it is unlikely that the teacher attempted to change these children's behaviour through methods other than praise.



Furthermore, studies investigating the effects of teacher praise or attention on appropriate child behaviour which incorporated control groups found no change in the controls (e.g. McAllister et al., 1969; Ward & Baker, 1968). However, control and experimental groups in these studies were comprised of highly disruptive children, rather than average children like those observed in the current study. While uncontrolled factors may have had no effect on the highly disruptive students, these factors may have had an influence on the children in this study.

There is one observation which appears to suggest that praise does not control on-task behaviour. The teacher's praise rate dropped drastically during audio cueing 2, yet the children's on-task behaviour was maintained at a high rate. Audio cueing 2 does not represent a withdrawal condition, since praise was not removed but was merely decreased in frequency. Once a behaviour is increased through frequent positive reinforcement, the frequency of positive reinforcement can be gradually decreased without decreasing the rate of the behaviour (e.g. Kazdin, 1980; Sundel & Sundel, 1975). During audio cueing 2, the teacher gradually decreased praise for on-task behaviour, which had been frequently

reinforced. Hence, it is reasonable that the level of on-task behaviour was maintained.

While factors relating to the increase in child on-task behaviour may be considered, the A-B time-series design does not allow for an adequate experimental test of these factors. Further research is required to determine the relative effects of increased praise and the uncontrolled variables cited.

#### Effect of Distribution of Praise on Class On-Task Behaviour

A further concern of this study was whether an equal distribution of praise among high, medium and low on-task children would result in higher levels of class on-task behaviour than directing 67% of the praise to a group of consistently low on-task children. The effect of directing 67% of the praise to the consistently low on-task children was tested with an A-B-A time-series design in which the 'focus praise package' was presented and removed. Since there was a steady increase in class on-task behaviour over time rather than a systematic change with the introduction and removal of the 'focus praise package', the differential effectiveness of one distribution of praise over the other for increasing class behaviour was not supported.



One piece of information which might suggest that distributing 67% of the praise to the consistently low on-task children was more effective than an equal distribution of praise is that the increase in class on-task behaviour was not significantly different from the baseline level until the audio cueing plus 'focus praise package' condition. However, the increase in class on-task behaviour may be due to the additional days of audio cueing, rather than to the altered distribution of praise per se. Hence, the class on-task data does not support the differential effectiveness of one distribution of praise over the other.

Effects of the Experimental Manipulations on the High, Medium, Low and Consistently Low On-Task Groups

Each of the high, medium, low and consistently low on-task groups was affected differently by the four audio cueing conditions. The only group which showed no change in on-task behaviour during any part of the study was the high on-task group. This lack of change is not surprising when it is considered that the high on-task group were 90% to 100% on-task during most of the study. This group had virtually no room for improvement.

One implication of this lack of change for the high on-task group is that the high on-task children do not

need praise to maintain high levels of on-task behaviour. This finding does not necessarily imply that the high on-task children should receive no praise at all, since receiving praise may be related to other important variables such as self-esteem. For example, Wilson (1975) found that teacher approval given for appropriate classroom behaviour resulted in increased feelings of self-esteem. Persons low in self-esteem have been found to exhibit more psychosomatic symptoms, set lower goals for themselves and conform more to group pressure than persons high in self-esteem (Coopersmith, 1967).

No argument will be made for the value of the concept of self-esteem or for the practical or theoretical usefulness of the above studies. The possible effect of praise on self-esteem is raised to caution against removing praise from high on-task children simply because their on-task behaviour does not increase. The removal of praise may affect other important overt or covert behaviours.

For the remaining groups, significant increases in on-task behaviour over the baseline level were found in audio cueing 1 for the low on-task group, in the audio cueing plus 'focus praise package' condition for the consistently low on-task group and in audio cueing 2



for the medium on-task group. Once each group attained a significant increase in on-task behaviour, the change was maintained in subsequent phases.

The interpretation of the data for the medium, low and consistently low on-task groups is equivocal. The latter three groups' on-task behaviour may have been affected by the increased rate of praise regardless of praise distribution, with each group requiring a different number of days of treatment for improvement.

Alternately, the medium, low and consistently low on-task groups may have been differentially affected by the two distributions of praise. An equal distribution of praise may have been sufficient to alter the behaviour of the low and medium on-task groups, with the medium on-task group requiring more days of treatment than the low on-task group. The consistently low on-task group may have required 67% of the praise before improvement could be attained.

One observation tends to suggest that focusing 67% of the praise on the consistently low on-task group rather than an increased praise rate per se changed this group's behaviour. The graph of on-task behaviour suggests that while there is no increasing or decreasing trend in audio cueing 1 or the audio cueing plus 'focus praise

package' condition for this group, the level of on-task behaviour is considerably higher in the latter phase. Such an increase in level would not have been predicted if the audio cueing 1 condition had been extended, suggesting that the altered distribution of praise was responsible for the increase.

However, there was no decrease in on-task behaviour with the removal of the 'focus praise package' as might be expected if the package were controlling on-task behaviour. This finding may be due to the consistently low on-task children receiving sufficient praise under an equal distribution of praise to maintain but not increase their on-task levels. If the least on-task children must receive 67% of the praise to initially increase their on-task levels and teachers praise children equally, then additional procedures to alter the teacher's distribution of praise will be required to alter the behaviour of the least on-task children. Furthermore, it may be a good strategy to give concentrated doses of praise to a small group of difficult children until improvement has been demonstrated, then to once more administer praise equally.

In summary, the high on-task children were unaffected by the experimental manipulations. With the design used



in this study, it is not possible to state with any certainty what variables were related to increased on-task behaviour for the remaining groups. However, the altered distribution of praise appears to have increased the behaviour of the consistently low on-task children. Uncontrolled factors which may have affected on-task behaviour have already been discussed. Further research is needed to determine the effects of increased rates of praise, an altered distribution of praise and uncontrolled factors on children of varying on-task levels.

#### Investigating the Effects of Two Distributions of Praise on On-Task Behaviour

The differential effectiveness of two distributions of praise can best be addressed by a between groups design. In a between groups design, some classrooms would be exposed to one distribution of praise, some classrooms would be exposed to an alternate distribution of praise and some classrooms would receive no treatment. Ideally, children in the various classrooms would be matched on initial on-task level.

The effects of uncontrolled variables would be reflected in the behaviour of the children receiving no treatment. The amount of on-task behaviour occurring

under each condition could be compared to determine (a) whether each distribution of praise resulted in more on-task behaviour than no treatment or uncontrolled factors and (b) whether one distribution of praise was more effective than another.

A single subject research design may be inappropriate for evaluating the effects of two distributions of praise because the effects of the second distribution of praise may be non-reversible. For example, in this study, changing to a distribution of praise in which 67% of the praise was directed to the consistently low on-task group increased the amount of on-task behaviour for this group. Reintroduction of an equal distribution of praise resulted in a lowered percentage of praise for the consistently low on-task group with this group receiving approximately one-third of the praise. The low on-task group responded at a high level, possibly because the lowered percentage of praise was sufficient to maintain child behaviour. On-task behaviour may not change systematically with the introduction and removal of an altered distribution of praise in spite of the effect on on-task behaviour. Hence, a reversal design may be inappropriate.



### Generalization of Results to Classrooms with Problem Children

The class observed in this study was judged to be average in terms of the amount of on-task behaviour displayed. Some clinicians report that groups of problem students usually range from 20% to 40% on-task (Holborn, S.H., Note 1). In this study, the low on-task group were 66% to 82% on-task. If this study were replicated in a class of problem children as defined above, the results may have been quite different. Further research is needed to determine whether the findings in this study apply to classrooms with problem children.

### Some General Comments on Methodology

Hersen and Barlow (1973) note that in a time-series design, each phase should be continued until stability is demonstrated. Stability refers to low variability in the data (Kratowill, 1978) and either a lack of trend or a trend which is opposite to the trend predicted in the next phase (Hersen & Barlow, 1976). Phases should also be of equal phase length. Hersen and Barlow (1973) concede that having stability and equal phase lengths represents an ideal which is not often met due to

constraints within a setting. The extent to which stability and equal phase length considerations were adhered to and any effects on data interpretation will be considered.

### 1. Variability

If data are highly variable, then there may be a great deal of overlap in data points among phases. The less the overlap, the more convincing the treatment effect (Kratochwill, 1978).

In the present investigation, there was a great deal of daily variability in both teacher and child behaviour. The daily fluctuations in teacher praise rate and percentage of praise directed toward the consistently low on-task children present no problem in interpretation. Data points either clearly overlap (signifying no difference) or there are virtually no points of overlap (signifying difference if there are no problems with trends).

The fluctuations in child on-task behaviour are more problematic. Visual inspection of the data was insufficient, in most cases, for determining differences among phases. Analysis of variance was therefore used. The overlap in data points among phases adds to the inconclusiveness of the effects of the experimental manipulations on child on-task behaviour.



## 2. Trends

With variable data, there is often no clearly discernable upward or downward trend (Hersen & Barlow, 1973). This observation applies to much of the data in this study. However, one exception was already noted. In the audio cueing plus 'increase praise package' condition, an increasing trend was observed on the final days of treatment. If this phase had been extended, a higher praise rate may have been attained.

### Length of Phase

Hersen and Barlow (1976) suggest that difficulties in interpreting data when phases contain unequal numbers of days occur when the baseline phase is much shorter than subsequent treatment phases. In such instances, changes in behaviour during the treatment conditions may be due to additional days of treatment. For example, if a baseline lasts for four days, then a treatment is given for eight days and no change is observed until five days into the treatment condition, then it is possible that the change in the behaviour is due to the additional days of treatment.

In this study, the number of days in each phase gradually decreased with each successive condition. Therefore, changes in child or teacher behaviour in

latter phases can not be attributed to additional treatment. Furthermore, changes in teacher and child behaviour generally tend to occur, if they occur at all, immediately after a treatment is introduced. Even if each treatment condition were artificially made equal by omitting the last days of treatment, the same results would be obtained.

#### Future Directions

With only two previous studies on audio cueing and no previous work relating individual children's on-task level to recipient of praise, many research possibilities exist. In addition to research possibilities cited in this text, parameters of the audio cueing system and the classroom setting (e.g. rate of the cue, size of the class, activities occurring in the class) could be investigated to determine optimal conditions for increasing on-task behaviour. Factors which account for the observation that some children are high on-task without receiving teacher praise can be considered. Further research might encourage our school systems to train teachers to praise, thus fostering the use of positive rather than negative classroom management procedures.



Reference Note

1. Holborn, S.H. Personal communication, July 18, 1980.

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Appendix A

Examples of praise statements and codes:

- (1) "You're sitting up, Wayne. Good." Wayne, social.
- (2) "Let's see hands for how many children had question five correct." (Seven people raise their hands).  
"Good for you. That's a hard one." Class, academic.
- (3) "You're really improving in your number work, Kathy." Kathy, academic.
- (4) "Fran, you're a smart little girl to remember to bring in your note this morning." Fran, neutral.
- (5) "Whoever did question one on the board did an excellent job of getting the right answer. That's a tricky question." Unspecified, academic.
- (6) "I see that Janet is looking at the board. That's what I like to see." Janet, social.
- (7) "You were looking at me when I was explaining the work, Mary, and I really like that." Mary, social.



Appendix BInstructions for Audio Cueing 1

The specific instructions given to the teacher prior to the implementation of audio cueing 1 were:

"One effective method we could use to improve classroom conduct would be to provide the children with a lot of attention for being good. Many studies conducted in classroom settings show that if a child does something good and is praised for it, he will be likely to do the same thing in the future. For example, one teacher praised her kindergarten children for following instructions and found that the children were more likely to do what the teacher asked them to do. Another teacher praised her class for being quiet, and found that the children became less noisy. We could use a similar procedure to increase constructive behaviours in this class. How do you feel about that?"

At this point, the experimenter waited for a reply. The teacher agreed that this kind of approach was a good one. The experimenter then replied that "It would be a good idea to structure what we are going to do in order to make it more effective. Often, it is easy for the teacher to forget to praise children or to give a lot of praise at once instead of spreading

the praise throughout the entire instructional period. For these reasons, I will give you a miniature cassette recorder which you can put in this pouch and an ear-phone to listen with. At randomly spaced times, you will hear a sound. This will be a cue for you to look up, find a child who is behaving well, and praise him. Remember that there will always be one child who is behaving well. How do you feel about doing that?"

The teacher agreed to comply with the experimenter's requests. The experimenter then continued, "When you praise a child, please use the child's name and describe the behaviour he or she is being praised for. This will make your praise more effective."

The experimenter informally discussed the behavioural definitions for teacher praise and child behaviour as described in the teacher's handout. Following this discussion, the teacher was told that she could also praise on-task behaviours at times when she did not hear the sound, if she so desired. However, it was stressed that she should praise every time she heard the audio cue.



Appendix C

This is a copy of the sheet defining praise which was presented to the teacher in the audio cueing 1 phase. None of the names provided in the examples given to the teacher were names of children in her class. This was done to avoid any suggestion of who should be praised.

Praise: A commendatory statement made to a child immediately after he has done something desirable or appropriate. Phrases such as "that's right," "that's correct" and "okay" should not be considered praise. In giving praise, the child's name should be used and the behaviour described. Try to praise for the following kinds of behaviours:

- (1) Manipulating teacher-specified materials

Examples:

- (1) Sharon, I see that you only have your math book on top of your desk. You're demonstrating good working habits.
- (2) Jenny, I really like it when you look at your math book when I've assigned you problems. You're really working well.
- (3) Jim, you really look like you're concentrating when your hands are on top of your desk. Good.

## (2) Sitting in the desk

Examples:

- (1) Fred, you're sitting up nice and straight in your chair. That's much better than having people wander about the room.

## (3) Head oriented in the direction of classroom activity

Examples:

- (1) You're looking at the board, Mary. Good.
- (2) Good going, Susan. You're looking at me when I talk.

## (4) Being quiet

Examples:

- (1) Jane, I notice that you're quiet, I think that's great. That's how I like to see boys and girls behave.
- (2) I'm pleased to see you so quiet, Jack.

(5) Following instructions<sup>10</sup>Examples:

- (1) You ask the class to take out their math books and Cheryl does so immediately. You might say, "You're really fast at following my instructions/ getting your math book out. Good, Cheryl."

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<sup>10</sup>This was included as a category because it was felt that if children were following instructions then they were engaging in appropriate head orientations, manipulating task required materials, etc. In other words, they were on-task.



- (2) You ask Helen to open the window and she does so immediately. You might say, "I really appreciate it when you do it right away, Helen, rather than wait until later."

Examples of some other praise statements:

(Add child's name and behaviour to:)

I'm really pleased...  
Miss Andrews (Mr. Butler) will be impressed...  
You're improving...  
...That's not bad.  
You make me proud...  
You were concentrating/listening/studying/behaving  
well when...  
Good. Good job. Good work. Great to see...

Appendix D

The teacher requested that the experimenter make some suggestions as to how she could smoothly integrate praise into routine activities. A handout was prepared with examples of praise statements that could be given during specific activities. Emphasis was placed on those areas cited by the teacher as problematic. The following is similar to the handout given to the teacher. In this version, there is some reorganization of the material and extra examples.

(1) Targeted Behaviour: Manipulating teacher-specified materials

(a) Teacher Activity: getting ready for roll call

(Optional) "Robert is reading a book in his spare time. It's nice to see you using your spare time constructively."

(b) Teacher Activity: conducting roll call

"I see Graham has his math book out and he's already to begin. Great."

"I see Mary has her pencil sharpened and she's ready to go. I really like to see that."

(c) Teacher Activity: reading the Bible story, or giving a lecture

"I like the way Penny has her hands folded on her lap. She's not tempted to play with things."

(d) Teacher Activity: walking around the class correcting work

"Joan, you only have the necessary things (name them) on your desk. Good. Sometimes people



play with things on their desk, but you're demonstrating good working habits."

(A child puts his hockey cards into his desk)  
"Joe, that's much better. You should be working at math."

(2) Targeted Behaviour: sitting in the desk

- (a) Time: these comments may be most appropriate just before and just after the second bell, or towards the end of the math period when some children have finished their assigned work. Giving praise for sitting in the desk may be given any time.

"Phyllis is sitting in her desk now that the first bell has gone. That's what I like to see."

(3) Targeted Behaviour: orienting the head in an appropriate direction

- (a) Teacher Activity: teaching at the board

"Kevin is looking at the board. Good."

"Linda's concentrating on the board. Good."

(Don't worry about repeating praise for paying attention to the board.)

- (b) Teacher Activity: reading the Bible story, or lecturing

"Charlie is paying attention by looking at me when I read. Excellent."

"I'm pleased that you're paying attention, and listening to the story, Pamela."

(4) Targeted Behaviour: being quiet

- (a) Teacher Activity: walking around correcting work

"Great to see you being quiet while the other children are working on their assignment, Helen."

- (b) Teacher Activity: getting ready for roll call

"Cathy, you're less chatty these days. Keep up the good work."

Appendix EInstructions for the Audio Cueing Plus'Focus Praise Package' Condition

The specific instructions given to the teacher prior to the implementation of the audio cueing plus 'focus praise package' condition were:

"During the last few weeks when you were praising the children a lot, I noticed improvements in most of the children's behaviour. However, some students have not improved as much as others. For this reason, I would like you to direct most of your praise towards these students to see if they can further increase their level of on-task behaviour."

"Here is a list of the names of these students. With so many children in the class, it would be difficult for you to remember exactly how many praises you gave to these particular children in a given session. For this reason, I would like to help you keep track of the number of praises you give to these children. I will do this in the following manner. During each class, I will spend part of my time noting who you are praising. At the end of each class, I will provide you with a slip of paper telling you what percentage of the total



number of praises went to the children on the list. Try to give 67% of your praise to these children. This means giving two out of every three praises, or 20 out of 30 praises to the group of children on the list. How do you feel about that?"

Once the teacher had agreed, the experimenter continued, "I will leave with you a list of class members. Please note that the first eight on the list are the children who are to receive 67% of the praise. You can keep this list on your desk and refer to it as a reminder of which children you are to praise. I would also like you to check off on a list which students in this group you recall having praised. I will leave you a checklist each day for this purpose and will collect the completed lists once or twice per week."

Appendix FInstructions for Audio Cueing 2

The specific instructions given to the teacher prior to the implementation of audio cueing 2 were:

"For the next part of this study, I would like you to select the students you would like to praise. I will no longer be providing you with information about whom I observed you praise and you will no longer be required to keep a record of which students you recall praising. Who you decide to praise is entirely up to you."

The teacher asked if it would be better if she praised the students on the list or if it would be better if she returned to her previous pattern of praise. She was told that the decision was entirely up to her.



Appendix GInstructions for the Audio Cueing Plus'Increase Praise Package' Condition

The specific instructions given to the teacher prior to the implementation of the audio cueing plus 'increase praise package' condition were:

"I have noticed over the past few weeks that the number of praises that you have given during math class has dropped. Have you been aware of that yourself?"

This question led to a discussion about why the teacher had given less praise during audio cueing 2. The teacher admitted that she was interested in finding out if the children would still behave well if she gave less praise. The teacher also stated that she was having trouble praising immediately after she heard the cue because the cue was often presented at an awkward moment, such as when she was in the middle of a sentence. The remainder of the instructions were provided ad lib and were similar to the following:

"If you praised a child each time you heard the cue, you would be giving 30 praises per hour. I would like you to aim for that goal. I would like to count the number of praises that you give during a portion

of each session and then I would like to calculate the number of praises you would give in an hour if you continued at that same rate. In order to get a rate of 30 per hour, you will have to praise each time you hear the cue, and the praise will have to occur as soon after the cue as possible, since I will be counting your rate of praise only some of the time. If you save the praise and give it all at once, you may be praising a lot when I am not observing you. Would you be willing to try this procedure?"

The teacher once more agreed to try.



## Appendix H

### Problems in Conducting the Study

A major problem in conducting the study was maintaining an acceptable level of reliability. While a high rate of reliability was attained during training (80% or better on 3 days' observations) and baseline, the reliability level dropped suddenly during audio cueing 1. Because of the good reliability during training and baseline when praise rates were low, it is felt that the baseline data is accurate.

A number of factors may have contributed to the drop in reliability in audio cueing 1. The reliability checker and the main observer trained by coding behaviours as they took place in the classroom. Before and during baseline, the teacher's praise rate was very low, and the topography of her praise was rather narrow. That is, her praise statements were generally given in response to asking children to raise their hands if they had their assigned math questions correct. Given the limited use and form of praise, it was fairly easy to discriminate when a praise statement was made.

This situation changed on a number of dimensions during the initial audio cueing phase. When the teacher began to increase her praise rate, she often spoke in

a very soft voice, which made it difficult to discern whether praise had been given. The teacher often failed to use the child's name when she praised, in spite of instructions to give the name of the child she was praising. This made it difficult to discern who received praise. The teacher also began to make statements which were ambiguous as to whom the recipient of praise was. For example, is Fred or both Fred and Jane the recipient(s) of praise in this instance? "Fred, I like the way you're looking at the board when I'm teaching. You too, Jane." Rules were then composed for classifying these new statements and were written down in the form of an addendum.

During observer training and baseline, child behaviour and teacher praise rates were monitored simultaneously, with adequate reliability being reported for both. Because of concern that higher levels of praise might also be interfering with accurate monitoring of two behaviours simultaneously, a decision was made to observe praise and child behaviour separately, beginning 7 days into the initial audio cueing phase or on day 20 of the study. Scoring child behaviour for 5 minutes was alternated with scoring teacher praise for 5 minutes. Whether praise or child behaviour was observed first was alternated for each session. These procedures ultimately resulted in acceptable reliability levels.



One variable which could not be held constant in this study was the seating arrangement of the children. Several children were moved from one seat to another on several different occasions. Most of the children were moved due to vision problems. The experimenter did not attempt to prevent these changes, since the school board had given permission for the study to be conducted only if the experimenter did not interfere with the usual functioning of the class. How the changes in seating arrangement affected this study, or if the changes had any effect at all, can not be determined. However, most studies in the area of classroom behaviour modification make no mention of whether seating location is held constant. This study may be comparable to other reports in terms of several rearrangements of seating locations for one or two children at a time.

Appendix IPercentage of On-Task Behaviourper Child per PhaseHigh On-Task Group

Child	Condition				
	A	B	BC	B	BD
1	92.5	88.9	94.6	78.6	81.5
2	95.8	97.1	100.0	95.8	100.0
3	93.3	95.7	90.2	100.0	93.5
4	93.1	91.3	92.7	96.2	100.0
5	92.1	94.3	100.0	100.0	100.0
6	98.9	100.0	100.0	100.0	96.4
7	93.3	93.0	97.4	100.0	96.6
8	95.6	95.7	100.0	86.7	96.6
9	98.2	100.0	95.1	100.0	89.3
10	93.2	93.0	93.5	100.0	100.0
11	95.5	97.2	97.5	100.0	100.0
12	93.2	97.0	92.7	89.3	100.0

Medium On-Task Group

Child	Condition				
	A	B	BC	B	BD
13	85.1	89.4	86.5	95.0	95.0
14	83.0	87.3	90.2	100.0	100.0
15	88.5	95.7	94.3	73.3	92.6
16	90.4	91.3	87.5	89.7	92.6
17	82.9	83.9	92.5	96.6	89.5
18	86.9	89.2	81.5	70.4	85.2
19	84.9	88.2	95.0	92.3	100.0
20	87.2	83.9	90.0	94.4	100.0
21	83.0	84.7	80.8	92.6	89.3
22	82.9	87.3	94.3	92.9	93.3
23	90.6	90.1	80.0	95.8	96.2
24	90.7	83.8	88.9	96.2	96.3



Low On-Task Group

Child <sup>a</sup>	Condition				
	A	B	BC	B	BD
25	81.8	96.9	89.7	100.0	100.0
*26	73.9	80.4	86.2	96.0	96.0
*27	75.2	88.6	88.9	80.0	88.5
*28	66.4	72.1	76.3	88.5	92.9
*29	69.8	75.9	86.5	92.3	96.7
*30 <sup>b</sup>	80.3				
*31	79.8	76.8	89.7	86.2	96.3
32	74.8	91.0	97.1	78.3	91.7
33	80.7	86.4	80.0	96.2	100.0
34	82.2	95.6	100.0	96.3	100.0
35	80.5	94.3	92.3	96.3	100.0
36	75.0	78.8	90.0	89.3	67.9
37	82.5	82.4	100.0	85.0	81.8

Note: A = baseline; B = audio cueing; C = 'focus praise package'; D = 'increase praise package'.

<sup>a</sup>The consistently low on-task children are labeled with an asterisk.

<sup>b</sup>This child was dropped from the study due to his absence on 7 out of 10 treatment days when the consistently low on-task children received 67% of the praise.

## Appendix J

### Methodological Implications

In this study, there were significant behavioural differences among at least two of the high, medium and low on-task groups for three phases. This finding is especially important when some methods for obtaining a measure of a behaviour for a group of individuals is considered. One method of obtaining a group index of a behaviour involves the simultaneous monitoring of a number of children over days and recording all occurrences of a target behaviour for each session. Examples of this method, or some variation of it, include monitoring aggressive behaviours in a Head Start classroom (Brown, Reschly & Sabers, 1974), observing inappropriate lunch-room behaviours of elementary school children (MacPherson, Candee & Hohman, 1974) and obtaining a measure of inappropriate behaviours exhibited by first grade children during a rest period (O'Leary & Becker, 1968).

Consider the experiment in which during one treatment phase, more high on-task than low on-task children attend class. During this treatment phase, it would be expected that more on-task behaviours would occur simply because the children being observed tend not to be problematic. In the present study, the problem of



inflating the on-task measure for the class was circumvented by calculating separate daily percentages of on-task behaviour for the high, medium and low on-task groups, then obtaining the average daily percentage over the three subgroups. A similar procedure might be adopted by other researchers who wish to avoid confounding a measure of group behaviour because of the inconsistent presence or absence of some individuals who display extremes of the behaviour being observed.