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Effects of different teaching styles on the teacher behaviours that influence motivational climate and pupils' motivation in physical education

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Abstract

This study investigated the effects of different teaching styles on the teaching behaviours that influence motivational climate and pupils' cognitive and affective responses in physical education. Four (two male, two female) initial teacher education (ITE) students and 92 pupils (47 boys, 45 girls), from two schools in the UK, participated in the study. The student teachers were filmed teaching three lessons each, adopting a different teaching style for each. The teaching styles (command/practice, reciprocal and guided discovery) were selected from Mosston and Ashworth's spectrum. The teaching behaviours were measured using a computer-coding system devised for Ames's guidelines on how to create a mastery climate. Focus groups were conducted to examine the pupils' cognitive and affective responses. Results revealed that the reciprocal and guided discovery styles resulted in more mastery and less performance focused teaching behaviours and more adaptive cognitive and affective responses than the command/practice style.

Key-words: motivational responses • observational analysis • TARGET • teaching behaviours

Introduction

Achievement motivation theorists (Ames, 1984, 1992a, 1992b; Duda, 1992; Nicholls, 1984, 1989), while adopting a social cognitive approach to the study of motivation and behaviour in educational and sport settings, have shown that achievement goal theory is successful in explaining and predicting beliefs, responses and behaviours in achievement settings (Roberts, 2001). According to Nicholls (1984),

the primary goal in achievement contexts such as physical education (PE) is to demonstrate high ability or to avoid demonstrating low ability. Two primary conceptions of ability subjectively define perceptions of success and failure in such contexts. Task involved individuals utilize an undifferentiated conception of ability, where ability is construed as effort and levels of ability are self-referenced and dependent upon improvement and learning (Nicholls, 1989). In contrast, ego involved individuals use a differentiated conception of ability, where ability is not construed as effort but is perceived as capacity and is demonstrated when outperforming others (Nicholls, 1989). Ego involvement can be further conceptualized into approach goals aimed at a demonstration of ability and avoidance goals aimed at avoiding a demonstration of low ability (Roberts, 2001). Nicholls (1989) contends that an individual's goal involvement in a particular situation is held to be the function of both a predisposition towards particular achievement goals (goal orientation) and situational factors (e.g. motivational climate). Recent studies (Cury et al., 1996; Dorobantu and Biddle, 1997; Spray, 2000) have suggested that, for compulsory PE settings, the perceived motivational climate is more important than goal orientations in determining achievement goals.

Motivational climate

A mastery (task involving) motivational climate is evident when self-referenced improvement and effort are emphasized by the teacher, and success is defined as improving one's personal best achievements (Ames, 1992a). In contrast, a performance (ego involving) climate prevails when the teacher encourages normative comparisons and pupils' success is judged in relation to the performance of others. Research in PE (e.g. Carpenter & Morgan, 1999; Christodoulidis et al., 2001; Escartí and Gutiérrez, 2001; Papaioannou, 1995; Solmon, 1996; Treasure, 1997) has revealed that perception of a mastery climate is correlated with adaptive motivational responses, such as a desire for self-improvement, feelings of satisfaction and less boredom, higher perceived ability and intrinsic motivation, the belief that effort and ability are causes of success and a more positive attitude toward PE. Furthermore, a perceived mastery climate has been found to be positively associated with increased physical activity behaviours (Parish and Treasure, 2003) and disciplined behaviour (Spray, 2002) in PE. In contrast, a perceived performance climate has been linked to maladaptive cognitive and affective responses, such as greater boredom, beliefs that ability rather than effort leads to success, a lack of enjoyment and a more negative attitude toward PE (Carpenter and Morgan, 1999; Christodoulidis et al., 2001; Escartí and Gutiérrez, 2001; Papaioannou, 1995; Solmon, 1996; Treasure, 1997).

Based on the work of Epstein (1989), Ames (1992b) suggests that in order to promote a mastery motivational climate the task, authority, recognition, grouping, evaluation and time structures (TARGET) of the classroom should be manipulated by the teacher (see Table 1). In accordance with Ames's (1992b) suggestion, in order to emphasize a mastery climate, the design of the tasks within lessons should be

Table 1 TARGET behaviours that influence motivational climate

TARGET behaviour	Mastery involving	Performance involving
Task	Self-referenced goals, multidimensional, varied and differentiated	Comparative goals, unidimensional and undifferentiated
Authority	Students given leadership roles and involved in decision-making	Teacher makes all the decisions
Recognition	Private recognition of improvement and effort	Public recognition of ability and comparative performances
Grouping	Mixed ability and cooperative groups	Ability groups
Evaluation	Self-referenced. Private diaries and consultations with teacher based on improvement and effort scores	Normative and public
Time	Flexible time for task completion	Inflexible time for task completion

Source: Ames, 1992b; Epstein, 1989.

designed to emphasize mastery goals, variety, novelty and differentiation. The authority structure should involve pupils in the learning process by providing them with choices and opportunities for making decisions. Recognition and evaluation should be focused on individual effort and improvement and be given privately whenever possible, thus providing all pupils with opportunity for success. The grouping structure within lessons should focus on cooperative group learning and the use of heterogeneous and varied grouping arrangements. Finally, the time structure should maximize learning time and allow individual pupils flexible time to complete tasks. Such a mastery focused teaching intervention has been found to enhance pupils' cognitive and affective responses in PE (Morgan and Carpenter, 2002; Solmon, 1996; Treasure, 1993). In contrast a performance climate would emphasize unidimensional competitive tasks, teacher authority, normatively based public recognition and evaluation, ability groups and inflexible time to practise.

Recently, Morgan et al. (2005) have used the Behavioral Evaluation Strategies and Taxonomies (BEST; Sharpe and Koperwas, 1999) software to develop a computer-based measure of the TARGET (Ames, 1992b) behaviours that influence motivational climate. The BEST software is a sophisticated, yet user-friendly system, which facilitates an observational analysis of behaviours in a wide variety of situations and settings. Specifically through the observation of live or videotaped situations, users count multiple events, coded according to a definable taxonomy, which permits the real time collection and analysis of a variety of frequency and duration records. Similar to the Physical Education Climate Assessment Instrument (PECAI) developed by Curtner-Smith and Todorovich (2002), Morgan et al.'s (2005) TARGET measure allows researchers to film PE lessons and to systematically code and analyse the teaching behaviours that impact upon pupils' perceptions of the motivational climate.

In their study, Morgan et al. (2005) filmed six student teachers teaching PE to different classes and used the BEST TARGET measure to code their teaching behaviours. Behavioural assessment of the TARGET structures revealed a strong mastery focus on self-referenced improvement and effort for the recognition and evaluation structures. In contrast the task design (undifferentiated and unidimensional) and authority structures (teacher centred) were strongly performance focused. Furthermore, the grouping structure involved more whole-class situations compared to small cooperative groups (more performance focused), while the time structure was more mastery focused (time to improve). Observation of the teaching styles used in the delivery of the lessons revealed that a traditional teacher centred style was used for the most of the lesson by all six student teachers. This is contrary to the pupil centred philosophy of the Physical Education National Curriculum (NCPE) (Department for Education and Employment (DfEE) and Qualifications and Curriculum Authority (QCA), 2000; ACCAC, 2000) and to the development of self-management skills, essential for making lifetime decisions about active living. Thus Morgan et al. (2005) have called for research to compare the effects of teacher centred and more pupil centred teaching styles from Mosston and Ashworth's (2002) continuum on the teaching behaviours that influence motivational climate in PE.

Teaching styles

The 'Spectrum of teaching styles' (Mosston and Ashworth, 2002) is a continuum of teaching styles categorized according to the decisions made by the teacher and/or learner in the planning (pre-impact), teaching (impact) and evaluation (post-impact) phases of the lesson. At the extreme 'teacher centred' end of the Spectrum is the Command style, in which the teacher makes all the decisions across all three phases of the lesson. At the other, pupil centred, end of the Spectrum is the Self Teaching style in which the learner takes full responsibility for the learning process. Between these two styles, Mosston and Ashworth (2002) have systematically identified and described a series of other styles, each with its own decision-making structure (Table 2).

The Spectrum can be further categorized into two distinct 'clusters', namely 'reproduction' and 'production'. In the reproduction cluster the central learning outcome is for pupils to reproduce or recall motor skills and known information, whereas in the production cluster, the central learning outcome is for pupils to discover new information or unique solutions to problems. Despite increasing awareness of and exposure to Mosston and Ashworth's Spectrum of teaching styles in PE settings over the last 25 years, research (Curtner-Smith et al., 2001; Mawer, 1999; Penney and Evans, 1999), has recently found that PE lessons in the UK are still dominated by the teacher centred styles.

Teacher education and observation research (Pichert et al., 1976) has found that teachers trained in Spectrum theory gave more individual feedback, displayed less domination of lessons and made better use of class time. These observed behaviours are directly linked to Ames's (1992b) TARGET recognition/evaluation, authority and

Table 2 Mosston's teaching styles

Style A Command – Teacher makes all the decisions
Style B Practice – Pupils practise teacher prescribed tasks
Style C Reciprocal – Pupils work in pairs, one as the teacher and one as the learner
Style D Self Check – Pupils evaluate their own performance against criteria
Style E Inclusion – Teacher provides alternative levels of difficulty for pupils
Style F Guided Discovery – Teacher plans a target and leads the pupils to discover it
Style G Problem Solving – Teacher presents a problem and pupils find their own solution
Style H Individual – Teacher proposes subject matter, pupils plan and design the programme
Style I Learner Initiated – Pupil decides content and plans and designs the programme
Style J Self Teaching – pupils take full responsibility for the learning process

Source: Mosston & Ashworth, 2002.

time structures respectively. Similarly, Ashworth (1983) found that Spectrum trained teachers engaged learners in more time on task (time structure), used more feedback (recognition/evaluation), engaged in more private and individual interactions with pupils (recognition/evaluation), gave fewer negative statements (recognition/evaluation), circulated more among children (recognition/evaluation and grouping), and altered their teaching styles more frequently (task objectives and variety). This evidence suggests, therefore, that Spectrum trained teachers display teaching behaviours that are closely linked to a mastery motivational climate (Ames, 1992b). Specifically, the learning objectives of the tasks have been found to be more varied, thus demanding different styles of delivery, pupils were given greater authority within lessons, recognition and evaluation was more frequent, had greater privacy and statements were less negative and the time on task was greater. Thus, Spectrum training may be a way of promoting behaviours that promote a mastery motivational climate. However, the difference in teaching behaviours when using different teaching styles has not been evaluated to date. Given that the more pupil centred teaching styles involve pupils in the decision-making process to a greater extent and have learning objectives that focus more on cognitive, social and personal development, it would seem logical that the teaching behaviours would be more mastery focused when adopting such styles in comparison to the more teacher centred styles. One way to evaluate this is to use Morgan et al.'s (2005) TARGET adaptation of the BEST software as an observational system to record behaviours when different teaching styles are used. The primary purpose of this study, therefore, was to evaluate the effects of different teaching styles, from Mosston and Ashworth's (2002) Spectrum, on the teaching behaviours that influence motivational climate in PE.

To date there is a dearth of research into the effects of different Spectrum teaching styles on pupils' motivation in PE. One of the primary aims of PE is to promote lifelong physical activity (Biddle and Chatsizarantis, 1999; Corbin, 2002) and children's motivational responses within PE lessons are considered central to lifetime physical activity adherence (Biddle and Chatsizarantis, 1999; Whitehead, 1994). It is somewhat surprising, therefore, that only one Spectrum study to date (Goudas et al., 1995) has examined pupils' motivation in PE.

Goudas et al. (1995) examined the effects of a practice style versus an inclusion style on pupils' goal orientations and intrinsic motivation in athletics lessons. In the inclusion style, pupils had choices about the level of difficulty of the tasks, the techniques they adopted and whether they wanted to be assessed by the teacher or to assess themselves. In the practice style, the decisions were made by the teacher. Results revealed that the inclusion style of teaching was associated with higher levels of intrinsic motivation and task orientation and lower levels of work avoidance. However, both these teaching styles were from the more teacher centred 'reproduction' cluster of the Spectrum. Such direct teaching styles concentrate on improving pupils' performance of activity but do not satisfy the requirements of the NCPE in England and Wales (ACCAC, 2000; DfEE and QCA, 2000), which states that pupils should also be provided with the opportunity to plan and evaluate movement (Curtner-Smith et al., 2001). The second purpose of this study was, therefore, to investigate the effects of teacher centred styles in comparison to more pupil centred teaching styles from the 'reproduction' and 'production' clusters of the Spectrum, on pupils' cognitive and affective motivational responses in PE lessons.

Method

Participants and procedures

Four Caucasian student teachers (2 male, 2 female; *M* age = 23.0, SD = 1.4) from the same UK university enrolled in a Post Graduate Certificate in Education (PGCE-PE) initial teacher education (ITE) programme, and a total of 92 (n = 47 boys and n = 45 girls) pupils (*M* age = 12.91, SD =.58) from two state comprehensive secondary schools in Cardiff, UK, participated in the study. The student teachers were informed that the purpose of the study was to evaluate the effects of different teaching styles on pupils' motivation in athletics lessons.

The student teachers were randomly selected from their cohort and provided informed consent to take part in the study. Permission to survey the pupils was obtained from the headteacher in both schools and all the pupils provided informed parent/guardian consent and informed assent to take part in the study. The pupils were taught by the student teachers in their normal PE lessons with the supervising PE teacher present. The range of lesson time was from 55 to 65 minutes. All classes were randomly selected for the study and were taught in single-gender situations.

The student teachers received a lead lecture on Mosston and Ashworth's (2002) spectrum of teaching styles as part of their PGCE PE course. The lecture lasted 1 hour and covered the structures, learning outcomes and practical PE related examples of the different teaching styles. Additionally, the student teachers received a 12-hour university teaching programme in athletics, which focused on fundamental event techniques and on implementing Mosston and Ashworth's (2002) spectrum of teaching styles.

Following the training, the student teachers were filmed teaching three PE lessons each to their randomly selected classes, adopting a different teaching style for each lesson. The three different styles used for the intervention were the command/practice style, reciprocal style and the guided discovery style (Mosston and Ashworth, 2002). These three styles were chosen for both theoretical and practical reasons. The theoretical rationale was to deliver a range of teaching styles that included the more teacher centred end of the 'reproduction' cluster of the Spectrum (command/practice), a more pupil centred style from the 'reproduction' cluster (reciprocal) and a pupil centred style from the 'production' cluster (guided discovery). Furthermore, the three different styles were selected for their different emphasis on the motor (all three styles), social (reciprocal style) and cognitive (guided discovery) learning domains.

From a practical perspective the three chosen styles were suitable for the learning outcomes of the lessons and the health and safety guidelines for athletics teaching (e.g. it would have been dangerous to teach a throwing lesson using an open-ended 'learner initiated' style).

According to Mosston and Ashworth (2002), different teaching styles should be selected to achieve different learning objectives. In accordance with this, the learning outcomes of the lessons were carefully chosen to allow the selected teaching styles to be used for as much of the lesson as possible. For example, in the reciprocal lesson the warm up involved pupil led 'pulse raising' and stretching activities in small groups and the guided discovery lesson involved pupils designing their own warm up routines in line with set principles. However, it is acknowledged that the selected style may not have been used for the entire lesson. The order of delivery of the different teaching styles was randomly selected by the teachers. In order to standardize the lesson content each style was matched to an athletics event and structured lesson plans and teaching resource materials (Morgan, 2001) were provided for the student teachers. The activities/events taught for the different styles were middle distance running (practice style), sprinting (reciprocal style) and shot put (guided discovery style) (see Appendix 1 for a brief description of the lesson content for each style). Curriculum athletics in the chosen schools was normally delivered in blocks of 8–10 weeks covering a different running, jumping or throwing event in each lesson. Pupils were, therefore, used to experiencing a full and varied range of athletic activities within the block. One option was to deliver the same athletic event four times using a different teaching style for each lesson. However, in discussion with the PE teachers in both schools it was decided that this would lead to motivational problems for the pupils and would potentially confound the findings. This would have been particularly evident for pupils who disliked the chosen event. Furthermore, pupils in the classes not involved in the study were experiencing a full range of different events and the study classes would have been fully aware of this, thus potentially compounding their dissatisfaction with the amount of repetition of events. In relation to teaching and learning the teachers also wanted the pupils to experience a full range of events within the block and were unhappy with a methodology which repeated the same

event three times. It was, therefore, decided to fit into the normal delivery of the athletics PE curriculum in the participating schools, and teach different athletics events for each of the lessons. The chosen method was, therefore, ecologically valid and in line with the usual delivery of athletic activities in the sample schools.

All 12 lessons were filmed during the summer term in weeks 20 to 24 of their total 26-week school experience during their one-year PGCE-PE. This enabled the student teachers to develop their Qualified Teacher Status (QTS) teaching standards fully before being filmed. QTS standards are descriptors of the level of competence in relation to subject knowledge, lesson planning, teaching and classroom management, assessment and other professional requirements that student teachers must achieve in order to gain QTS. None of the filmed students were failing on any of the QTS standards. All lessons were in the athletics area of activity and they occurred mainly outside, on grass playing fields, or indoors in a sports hall or gymnasium. Resources available were ample and appropriate for the lessons observed.

In order to film the lessons, a camcorder was mounted on a tripod and positioned so as not to interfere with the lesson and to focus on the student teacher throughout the lesson. The student teachers wore a wireless microphone. The video recording began when all of the pupils had arrived in the lesson area and continued until the pupils were dismissed by the student teacher.

Measure of teaching behaviours that influence motivational climate

Analysis of the video data was conducted using the TARGET (Ames, 1992b) configuration modification of the Behavioral Evaluation Strategies and Taxonomies (Sharpe and Koperwas, 1999) software, developed by Morgan et al. (2005). The CD-ROM software permits the collection and immediate analysis of data gathered from observations of PE teaching from video and audio recording of lessons. The computer keyboard was configured to permit the recording of multiple and overlapping frequency behaviours (how many) and duration behaviours (how long) through pressing the appropriate keys. Based on Ames's (1992b) description of TARGET areas and motivational strategies, mastery, performance, and neither categories were identified and assigned a computer keyboard number or letter for coding of behaviours (see Table 3 for a description of the categories).

The frequency of mastery, performance and neither tasks and recognition/evaluation provided by the teachers was coded so that comparisons could be made between teaching styles. For the authority, grouping and time structures, the duration of the teaching behaviours was coded. Duration, rather than frequency, of these structures was coded because the amount of time that pupils were given to make decisions and take on leadership roles, the time spent in mastery and performance groups and the flexibility of time to complete tasks were of primary interest to the researchers in evaluating differences in pupils' mastery and performance experiences when different teaching styles were used. Validity and acceptable intra and inter reliability (greater

Table 3 TARGET coding for the analysis of teaching behaviours related to motivational climate

TARGET structure	Mastery		Neither		Performance	
Task (frequency)	Self-referenced/group-referenced goal	1	No clear goals	3	Competitive goal	2
	Multidimensional/different tasks	5	Warm up/Cool Down goal	4	Unidimensional/same task	6
	Differentiated/suitably challenging for all	7			Undifferentiated/not suitably challenging for all	8
Authority (duration)	Pupils involved in leadership roles and/or decision-making	9			Teacher makes all the decisions	0
Recognition and evaluation (frequency)	Recognition/evaluation focused on self-referenced effort, improvement, attainment, knowledge in private	R	General assessment/feedback (to no one in particular)	G	Recognition/evaluation focused on normative ability, knowledge comparisons	N
	Recognition/evaluation focused on self-referenced effort, improvement, attainment, knowledge in public	E	Focus on luck	L		
Grouping (duration)	Small heterogeneous/mixed ability groups	M			Homogeneous/ability groups	A
	Cooperative/individualistic groups	H			Competitive groups	C
					Large group/whole class	W
Timing (frequency)	Flexible time to practise, plan or evaluate	F	Inactive time	I	Inflexible time to practise, plan or evaluate	P

than .80) was established during the development of the measure (Morgan et al., 2005) in line with Sharpe and Koperwas's (1999) recommendations to ensure reliability and accuracy of data records and the use of recognized agreement tests and reliability procedures (Kazdin, 1982).

Two researchers, instrumental in the development of the behavioural measure of motivational climate (Morgan et al., 2005) and trained in its use, undertook video analysis simultaneously. The flexibility of the BEST system allowed the two researchers to pause both the video and the software system and to replay the video for discussion until unambiguous 100 percent agreement was reached on the coding of the mastery, performance and neither categories of teaching behaviours.

Focus groups

One week after the completion of the three week teaching programme, a random selection of 8 pupils from each of the four participating classes were asked to participate in four separate focus group discussions with the lead researcher. The purpose of the focus groups was to investigate pupils' cognitive and affective responses to the different teaching styles. Two pupils were absent on the days of the focus groups leaving a total of 30 participants (n = 15 boys and n = 15 girls from the overall sample of 92 (n = 47 boys and n = 45 girls; M age = 12.91, SD =.58). The researcher had previous experience of conducting focus groups and significant experience of questioning pupils in a school setting to gain insight into their learning and understanding in PE lessons. The focus groups took place during school break time, in a room free from distraction and pupils were positioned in a semi-circle facing each other and the lead researcher (Krueger, 1994). Following an introduction to the purpose of the focus group, the participants were asked to think about and write down the best and worst features of each of the lessons in the study. Cues were given by the researcher about each of the lessons to remind pupils about the content and the style of delivery and to enhance retrospective recall of the lessons (Krueger, 1994). This written information then formed the basis of a 20-minute group discussion. During the discussion the researcher chose one style at a time and encouraged the pupils to share their thoughts and feelings about the best and worst features of that style. Pupils were fully aware that their responses were totally confidential and that the class teacher would not get to hear them. The researcher asked different pupils to contribute at different times in order to ensure equal input among participants and to include quieter members of the group (Krueger, 1994). Equal input was also assisted by the pupils' reference to their written notes on each style. The researcher took brief notes throughout the sessions but was careful not to allow this to interfere with his attention to the group. At the end of the focus group the researcher summarized the notes taken about each teaching style, checked for accuracy with the pupils and asked for any additional comments. The pupils' written responses to each of the teaching styles were then collected and the pupils were dismissed.

Results

Behavioural analysis

The mean percentage of 'mastery', 'performance' and 'neither' coded teaching behaviours was calculated for the combined TARGET structures for each of the teaching styles (Table 4) and for each of the TARGET structures individually (Tables 5–7). As justified in the method section, the mean percentage frequency of coded behaviours was calculated for the task, recognition and evaluation structures, whereas for the authority, grouping and time structures the mean percentage duration of teaching behaviours was calculated. To determine whether any significant differences existed between the teacher behaviours that influence motivational climate when the different teaching styles were used, a series of one-way analysis of variance (ANOVA) was conducted. A multivariate analysis of variance (MANOVA) was not conducted due to the low participants to dependent variables ratio (Tabachnick and Fidell, 1996). Due to the number of ANOVAs conducted, a Bonferroni method of adjustment was made in order to prevent Type 1 errors. This resulted in the adjusted alpha level being .002.

Results revealed significant differences between teaching styles in mean percentage combined mastery and performance teaching behaviours (Table 4). Analysis of the individual TARGET structures (see Table 3 for the coding categories) showed significant differences between teaching styles in performance (competitive) goals (Table 5), mastery authority (pupils involved in leadership roles and/or decision-making) and performance authority (teacher makes all the decisions) (Table 6), competitive grouping (competing against others in the group) (Table 7) and flexible (pupils able to organize their own time) and inflexible time to practise (Table 7).

Follow-up post-hoc Tukey tests revealed significant differences between the command/practice style and both the reciprocal and guided discovery styles in overall mastery and performance teaching behaviours. Specifically, the command/practice style was significantly lower than the reciprocal and guided discovery styles in combined mean percentage mastery behaviours (Table 4). Furthermore, the command/practice style was significantly higher in combined mean percentage performance behaviours (Table 4).

Table 4 Comparison of combined TARGET structures across teaching styles

Mean % TARGET behaviours	Command/ practice		Reciprocal		Guided discovery		ANOVA		
	M	SD	M	SD	M	SD	*F*	*p*	*d.f.*
Mastery	25.02	6.95	49.18	8.70	40.95	2.53	13.87	.002*	2, 9
Performance	47.97	7.86	25.72	5.92	33.11	1.86	15.36	.001*	2, 9
Neutral	24.02	3.47	22.96	6.04	25.47	3.35	.317	.21	2, 9

* significant at .002 level.

Table 5 Comparison of the task structure between teaching styles

Mean % TARGET behaviours	Command/practice		Reciprocal		Guided discovery		ANOVA		
	M	SD	M	SD	M	SD	*F*	*p*	*d.f.*
Mastery goals	67.16	8.45	38.24	19.85	67.36	10.75	5.80	.02	2,9
Performance goals	0	0	15.02	2.02	0	0	220.17	.00*	2,9
Warm up goals (neither)	29.27	12.77	46.72	20.96	28.46	19.03	1.32	.31	2,9
No clear goals (neither)	3.57	7.14	0	0	4.16	8.33	.51	.62	2,9
Multidimensional tasks (mastery)	0	0	34.82	22.61	9.98	1.81	7.50	.01	2,9
Unidimensional tasks (performance)	100	0	65.17	22.61	90.01	1.81	7.50	.01	2,9
Differentiated tasks (mastery)	0	0	31.69	25.14	9.98	1.81	4.95	.04	2,9
Undifferentiated tasks (performance)	100	0	68.30	25.14	90.01	1.81	4.95	.04	2,9

* significant at .002 level.

Refer to Table 3 for further descriptions of mastery, performance and neither behaviours.

Table 6 Comparison of authority and recognition/evaluation structures between teaching styles

Mean % TARGET behaviours	Command/practice		Reciprocal		Guided discovery		ANOVA		
	M	SD	M	SD	M	SD	*F*	*p*	*d.f.*
Pupil authority (mastery)	3.56	4.37	56.5	6.98	43.2	9.07	60.6	.00*	2,9
Teacher authority (performance)	96.82	4.39	43.8	7.01	56.86	9.26	60.6	.00*	2,9
Mastery recognition and evaluation in private	6.94	12.89	8.06	11.83	1.07	1.25	.55	.60	2,9
Mastery recognition and evaluation in public	26.53	15.62	59.62	20.31	44.45	20.81	3.02	.10	2,9
Performance recognition and evaluation	27.65	35.47	3.73	3.41	6.36	11.2	1.48	.28	2,9
General recognition and evaluation (neither)	38.87	20.70	28.56	22.24	48.09	20.68	.85	.46	2,9
Luck recognition and evaluation (neither)	0	0	0	0	0	0	–	–	2,9

* significant at .002 level.

Refer to Table 3 for further descriptions of mastery, performance and neither behaviours.

Table 7 Comparison of grouping and time structures across teaching styles

Mean % TARGET behaviours	Command/practice		Reciprocal		Guided discovery		ANOVA		
	M	SD	M	SD	M	SD	*F*	*p*	*d.f.*
Whole group (performance)	23.36	7.35	11.36	5.57	6.20	3.43	9.61	.006	2,9
Cooperative groups (mastery)	76.63	7.35	84.06	5.42	93.79	3.43	9.34	.006	2,9
Competitive groups (performance)	0	0	4.57	.49	0	0	338.10	.00*	2,9
Mixed ability groups (mastery)	44.31	44.44	88.63	5.57	93.79	3.43	4.4	.05	2,9
Ability groups (performance)	32.31	37.82	0	0	0	0	2.92	.11	2,9
Flexible time (mastery)	0	0	41.0	8.99	4.82	1.90	71.4	.00*	2,9
Inflexible time (performance)	51.59	10.83	19.46	5.02	48.55	7.15	19.47	.001*	2,9
Inactive time (neither)	48.41	10.83	39.52	5.94	46.61	6.98	1.31	.32	2,9

* significant at .002 level.

Refer to Table 3 for further descriptions of mastery, performance and neither behaviours.

Further post-hoc analysis of the individual TARGET structures revealed significantly lower mean percentage pupil authority (Table 6) and higher teacher authority (Table 6) for the command/practice style compared to the reciprocal and guided discovery styles. Significant differences also emerged between the reciprocal style and the other two styles in the setting of competitive goals (Table 5), organizing pupils into competitive groups (Table 7) and flexible and inflexible time to practise (Table 7).

Focus group analysis

Analysis of the focus group data was conducted in three phases. First, all the written responses of the pupils were grouped into the positive and negative aspects of each of the teaching styles by the lead researcher. Second, similar pupil responses were grouped inductively, a common response theme was devised to represent them (e.g. 'he encouraged us well' and 'the teacher kept telling us to try harder and get better' were grouped together and represented by 'the teacher encouraged effort and improvement') and the percentage of total participants who indicated that response was calculated. Finally, the response themes were deductively grouped into the TARGET (Ames, 1992b) categories by the lead researcher (see Table 8) for consistency with the behavioural data analysis.

A summary of the focus group response themes is presented in relation to each of the TARGET structures in the following section (see Table 3 for a reminder of the 'mastery', 'performance' and 'neither' dimensions of the TARGET structures). The full list of the percentage pupils' response themes is given in Table 8, but for the following section only the higher percentages (by over 10 percent of all pupils) are reported, with the exception of the grouping structure, where the most common response theme was 7 percent of all pupils.

Task

Deductive analysis of the focus group responses in relation to task goals, design and differentiation revealed that the most positive feature of the command/practice style was enjoyment of the variety of tasks in the warm up phase (27%), whereas, the negative responses included boredom of the tasks in the main part of the lesson (running) (30%) (e.g. 'it was a bit boring because all we did was run'), the tasks being repetitive (23%) and disliking the tasks set in the lesson (17%). The most positive features of the reciprocal style were reported as learning of the tasks (37%) (e.g. 'we learnt how to start correctly'), the variety of tasks (13%) and the fun element of the lesson (13%). The most frequent negative response for the reciprocal style was finding the tasks boring (17%). For the guided discovery style, pupils most frequently reported that they 'enjoyed trying out different techniques' (27%) and that the lesson progressed well (17%) (e.g. 'the lesson gradually built up the correct way to throw'). The negative responses for this style were the boredom factor (13%) and that there was insufficient warm up (10%).

Table 8 Percentage (of all pupil responses) focus group responses to the different teaching styles

TARGET structures	Practice style	Reciprocal style	Guided discovery style
Task	*Positive responses* Enjoyed the warm up (27%) Enjoyed running (7%) Learned how to get fit (3%) *Negative responses* Lesson was boring (30%) Lesson was repetitive (23%) Didn't like running (17%) Didn't learn much (7%) Warm up too long (7%) Didn't warm down (7%) Lower ability groups should have run shorter distances (3%)	*Positive responses* Learnt how to start correctly (37%) Good variety of activities (13%) Lesson was fun (13%) *Negative responses* Found it boring (17%) Not enough variety (3%) Insufficient warm up (3%) Activities were repetitive (3%)	*Positive responses* Enjoyed trying out the different techniques (27%) Lesson gradually built up the correct way to throw (17%) Lesson was fun (7%) Did different things so we didn't get bored (3%) (17%)Interesting lesson (3%) *Negative responses* Lesson was boring (13%) Not enough warm up (10%) Too much repetition (7%) Pointless activities (7%)
Authority	*Positive responses* Good teacher demonstrations (7%) Good explanations (7%) Well organized (3%) Teacher told us the pace to run at (3%) *Negative responses* No opportunity to make any decisions (3%)	*Positive responses* Enjoyed teaching each other (30%) Good demonstrations from teacher (3%) Clear guidelines (3%) Good explanations (3%) *Negative responses* Sheets needed clearer explanation (13%) Teacher was strict (3%) Some people messed around (3%)	*Positive responses* Good demonstrations (10%) We worked out the correct way to throw (3%) Clear instructions on what to do (3%) *Negative responses* Some pupils messed around (3%) Didn't understand some of the instructions (3%) Teacher didn't do much (7%)

Table 8 Continued

TARGET structures	Practice style	Reciprocal style	Guided discovery style
Recognition and Evaluation	*Positive responses* Teacher encouraged effort and improvement (30%) Teacher was helpful (13%) Enjoyed improving (10%) Teacher praised us (3%) Pupils encouraged each other (3%) *Negative responses* Teacher only paid attention to certain pupils (3%) No competition (3%)	*Positive responses* Improved my speed (3%) *Negative responses* No races between us (3%)	*Positive responses* Improved my performance (23%) Learned new skills and how to improve technique (17%) Teacher helped individuals (7%) Improved my confidence (3%) Teacher gave good encouragement (3%) *Negative responses* Didn't get time for a fully measured and recorded throw (7%)
Grouping	*Positive responses* Put in to groups of ability so as not to show us up (7%) *Negative responses* Mixed abilities in the same group made it hard for some (3%) Didn't like performing after the higher ability group had been (3%)		*Positive responses* Worked with friends and helped each other (7%)
Time	*Positive responses* Good exercise (3%) Lesson was intense (3%) *Negative responses* Not enough time (17%) Weren't all fully involved in the lesson (7%)	*Positive responses* Lots of time to practise and learn (13%) *Negative responses* Lesson was slow (7%) Not enough time (7%)	*Negative responses* Lesson was too slow (17%) Too much standing around (7%) Teacher spent too much time talking (3%) Not enough time on each technique (3%) Warm up was too long (7%)

Authority

The pupils' focus group responses that related to the authority structure (decision-making and leadership roles) revealed that for the command/practice style less than 10 percent of the pupils agreed on any of the positive or negative features of the leadership and decision-making aspects of the lesson. For the reciprocal style, however, 30 percent of the pupils said that they enjoyed teaching each other (e.g. 'it was great fun helping each other'), whereas 13 percent said that the resource sheets needed further explanation by the teacher. Responses to the guided discovery style indicated that 10 percent of the pupils thought that the teacher-led demonstrations were good.

Recognition and evaluation

Focus group responses to recognition and evaluation structures in the command/practice style lessons revealed that 30 percent of the pupils felt that the teachers encouraged effort and improvement (e.g. 'teacher kept telling us to try harder and get better'), 13 percent thought that the teacher was helpful (e.g. 'he looked at everyone and helped') and 10 percent enjoyed improving. None of the responses to recognition or evaluation in the reciprocal style were stated by over 10 percent of the pupils. For the guided discovery style 23 percent said that they had improved their performance and 17 percent believed that they had learned new skills and techniques (e.g. 'I learned new skills and how to improve technique').

Grouping

None of the responses about the grouping of pupils was common to over 10 percent of pupils in any of the teaching styles. However, there was reference by 7 percent of the pupils to ability groups as a positive aspect in the command/practice style (e.g. 'he put us in different groups according to our ability so as not to show us up'). Seven percent of the pupils in the guided discovery style referred to working with friends and helping each other as a positive aspect.

Time

In relation to the time structure (activity time and flexibility of time) of the lessons, 17 percent of pupils commented that there was insufficient time in the command/practice lesson. Similarly, 17 percent of pupils felt that the pace of the guided discovery lesson was too slow. Contrary to this, 13 percent of pupils thought that there was lots of time to practise and learn in the reciprocal style lessons.

Discussion

The primary purpose of this study was to evaluate the effects of different teaching styles on the teaching behaviours that influence perceptions of the motivational climate. The secondary purpose was to compare pupils' motivational responses to each of the teaching styles used in the study. Accordingly, the discussion is structured into two phases and a final section is written in an attempt to compare the two sets of data and to draw common conclusions and recommendations for physical education teachers.

Teacher behaviours

Video analysis of the teacher behaviours that influence motivational climate revealed that the direct teacher centred command/practice style (Mosston and Ashworth, 2002) resulted in significantly less mastery and more performance focused teaching behaviours (when all the TARGET structures were combined) in comparison to the reciprocal and guided discovery styles. This has significant implications for the teaching of PE in the UK as recent research (Curtner-Smith et al., 2001; Mawer, 1999; Penney and Evans, 1999) has shown that the direct teacher centred command style still dominates PE teaching, despite several changes to PE brought about by the National Curriculum (Kirk, 2005).

Motivational climate research (e.g. Carpenter and Morgan, 1999; Christodoulidis et al., 2001; Escartí and Gutiérrez, 2001; Papaioannou, 1995; Solmon, 1996; Treasure, 1997; Parish and Treasure, 2003) has consistently shown that a mastery climate results in more adaptive motivational responses than a performance climate. More specifically, cognitive, affective and behavioural responses such as a desire for self-improvement, feelings of satisfaction and less boredom, higher perceived ability and intrinsic motivation, the belief that effort and ability are causes of success, a more positive attitude toward PE and increased physical activity behaviours, have been linked to perceptions of a mastery climate. Perceptions of a performance climate, in contrast, have been associated with maladaptive motivational responses such as greater boredom, beliefs that ability rather than effort leads to success, a lack of enjoyment and a more negative attitude toward PE (Carpenter and Morgan, 1999; Christodoulidis et al., 2001; Escartí and Gutiérrez, 2001; Papaioannou, 1995; Solmon, 1996; Treasure, 1997). Thus, promoting the teaching behaviours that help to create perceptions of a mastery climate is vitally important in fostering positive motivational patterns in PE lessons.

The findings of this study, that the pupil centred reciprocal and guided discovery styles resulted in more mastery and less performance focused teaching behaviours than the traditional command/practice style, suggest that in order to foster a mastery motivational climate and reduce the behaviours that lead to a performance focused climate, teachers should use more pupil centred teaching styles rather than the traditional teacher centred command/practice style. However, within-class differences

in perceptions of the motivational climate mean that different pupils may perceive the same teacher behaviours differently. Furthermore, it is still uncertain as to whether the TARGET structures interact in an 'additive' or 'multiplicative' way (Ames, 1992c). If they are additive then a low mastery focus in one structure (e.g. pupil authority) can be compensated for by strengths in another (e.g. evaluation). If, on the other hand, the structures are multiplicative, they cannot compensate for each other. Hence, if the structures interact in a multiplicative way and, for example, the teacher sets multidimensional mastery based tasks but emphasizes normative, performance-involving standards for evaluation, he/she would not be able to foster perceptions of a mastery climate. In other words, if a multiplicative relationship exists, all the TARGET structures would have to be mastery focused in order for pupils to perceive a mastery climate. Contrary to this, recent research by Morgan et al. (2005) has suggested that an additive relationship exists between the TARGET structures and that the recognition and evaluation structures have the greatest impact upon perceptions of the climate. However, further research is needed to address this important issue and the implications for the design and delivery of PE lessons.

Analysis of the individual TARGET teaching structures revealed significantly less pupil authority (decision-making and leadership roles) and significantly more teacher authority in the command/practice style lessons compared to the reciprocal and guided discovery style lessons. If educating pupils to take responsibility for their own learning and to develop lifelong physical activity behaviours is a key aim of the PE curriculum, then allowing pupils to make decisions in lessons should be an essential outcome. Moreover, in order to fulfil the aims of the National Curriculum for PE (NCPE) in England and Wales (ACCAC, 2000; DfEE and QCA, 2000), which are focused on pupils' planning and evaluating in addition to the performance element of PE, pupils need to be given an appropriate amount of authority within lessons. Furthermore, recent research (Valentini and Rudisill, 2004) has shown that a mastery intervention PE programme, consistent with Ames (1992b) TARGET structures, designed for 'high autonomy', resulted in significantly better loco-motor performance, in comparison to a 'low autonomy' group. Giving pupils autonomy within lessons, therefore, would seem to be an effective strategy in developing all three aspects of planning, performing and evaluating in PE (ACCAC, 2000; DfEE and QCA, 2000).

Further analysis of the individual TARGET structures revealed that teachers set significantly more competitive goals and pupils participated in more competitive groups in the reciprocal style than the other two styles. This was evident in the final phase of the lesson (Appendix 1) where pupils were required to perform a timed sprint. Reference to Table 5 reveals that 15 percent of the lesson goals set by the teacher in the reciprocal style lessons were performance focused (competitive), whereas 38 percent were mastery (self-referenced) and 47 percent were neutral (warm up goals). Closer scrutiny of the raw data revealed that, even though significant differences were found, only one competitive task per lesson was set by the teacher in the reciprocal lessons, compared to no competitive tasks in the other two lessons. Teachers

should aim to set mastery goals, which are focused on self-referenced effort and improvement and individual progress, in order to create a mastery motivational climate (Ames, 1992b), regardless of the teaching styles used. Table 7 reveals that pupils were in competitive groups in the reciprocal style lessons for less than 5 percent of the time, compared to 84 percent in cooperative groups and 11 percent as a whole group. The significant difference emerged between the reciprocal style and the other two styles because the pupils were not organized into competitive groups for any phase of the command/practice or guided discovery style lessons.

The final difference in individual TARGET structures that emerged between teaching styles was for the use of flexible time in lessons. Results revealed that the reciprocal style lessons had more flexible time to learn in comparison with the other two styles. Ames (1992b) contends that, in order to create a mastery climate, the time allocation within lessons needs to be flexible to deal with diversity and to allow pupils to learn at an optimal rate. Thus, the reciprocal style was most effective in creating a differentiated time structure in this study.

Focus groups

In this section the pupils' focus group responses (Table 8) are considered in relation to each of the TARGET structures. Similarities and differences between teaching styles are identified and the implications for physical educators are discussed. Beginning with task goals and design, a high proportion of pupils enjoyed the variety of activities in the warm up phase of the command/practice lessons, but found the main phase of the lessons boring and repetitive. Furthermore, some pupils disliked the tasks set in the command/practice style lessons and commented that their learning was limited. In contrast, a high percentage of pupils commented on the learning aspect of the reciprocal style and the enjoyment of trying out different techniques in the guided discovery style lessons. Pupils also felt that the guided discovery style promoted effective technique progressions. A much smaller percentage of pupils found the reciprocal and guided discovery lessons boring in comparison to the command/practice style. Ames (1992b) suggests that in order to foster a mastery motivational climate, teachers should focus on variety, diversity and novelty of tasks and set task goals for individual progress and learning. In relation to Ames' guidelines the focus group responses indicate that the more pupil centred reciprocal and guided discovery styles were more effective in creating a mastery focused task structure.

When considering the authority structure, the only positive comments about the command/practice style were directed at the effectiveness of the teacher led demonstrations and explanations. This indicated a more teacher centred, performance involving motivational climate (Ames, 1992b). Effective demonstrations were also highlighted in the responses to the guided discovery style. In comparison, a high proportion of pupils enjoyed the opportunity to take on a leadership role and teach each other in the reciprocal style lessons. Some felt however that the reciprocal

worksheets needed further explanation by the teacher. According to Ames (1992b), giving pupils the opportunity to adopt leadership roles in lessons helps them to develop the skills that will enable them to take responsibility for their own learning. Regular exposure to the leadership roles associated with more pupil centred styles of teaching, such as the reciprocal style, may therefore help to develop pupils' self-management skills to make lifetime decisions about active living.

Pupils' focus group responses to the recognition and evaluation structure revealed a positive teacher focus on effort and improvement in the command/practice style lessons. This was also clearly evident in the comments about the guided discovery style, coupled with a perception that they had learnt new skills and improved techniques. Such positive recognition and evaluation has been found to increase children's interest in learning, their self-confidence and sense of satisfaction (Ames, 1992b).

Some interesting findings emerged in the focus group responses related to the grouping structure. When reflecting on the command/practice style the pupils' responses suggested that, contrary to Ames (1992b) guidelines on creating a mastery motivational climate, some preferred to be grouped by ability, so as not to be embarrassed during the activities (Table 8). In the guided discovery and reciprocal style lessons, however, pupils seemed to prefer cooperative friendship groups, which is consistent with a mastery climate. This may be explained by the fact that the combined teaching behaviours in the command/practice style were more performance focused than the other two styles. According to Ames (1984), when a performance climate prevails, the focus is on outperforming others and consequently the groups become competitive and assessment is viewed as normative. In a performance involving situation, therefore, pupils may prefer to be in groups of similar ability so that they do not compare unfavourably to others in the same group. On the other hand, when more mastery focused goals are set (as was evident in the reciprocal and guided discovery style lessons) the focus is on self-improvement and effort, which is more likely to foster cooperation rather than competition in the grouping structure. In such situations, it would seem more likely that pupils would prefer to be in friendship groups so that they feel comfortable and confident in helping each other.

Finally, the responses that refer to the time structure indicate that pupils valued having lots of time to practise in the reciprocal style. Contrary to this, some pupils commented on the slow pace of the lessons in the command/practice and guided discovery style lessons. The chosen activity (shot put) for the guided discovery style lessons in this study may have had an impact on the pace of the lessons and the flexibility of the time structure. Due to health and safety guidelines it was necessary to use a command style in association with the guided discovery style for the main phase of the lesson, which involved the whole class shot putting. The fact that the slow pace of the lesson was identified by some pupils and not others, in the command/practice and guided discovery style lessons, indicates the differences in pupils' rates of learning and highlights the importance of flexible time to allow pupils to progress at their own optimal rate (Ames, 1992b). Pupils also preferred to be fully involved in the command/practice lessons even when they were not physically active themselves. This

links well with the NCPE in England and Wales (ACCAC, 2000; DfEE and QCA, 2000), which specifies that pupils should be fully involved in the planning and evaluation aspects of the lesson, as well as the performing.

Comparison between teacher behaviours and focus group responses

When comparing the analysis of the teaching behaviours with the focus group responses for each of the teaching styles some interesting findings emerge. First, the more pupil centred reciprocal and guided discovery styles of teaching resulted in significantly more mastery and less performance focused teacher behaviours in comparison to the more direct teacher centred command/practice style of teaching. Congruent with these findings and with research on participation in mastery intervention programmes in PE (e.g. Carpenter and Morgan, 1999; Christodoulidis et al., 2001; Escartí and Gutiérrez, 2001; Papaioannou, 1995; Solmon, 1996; Treasure, 1997), pupils' focus group responses were more adaptive for the more pupil centred styles, with a greater focus on learning, improvement, variety and enjoyment and less reference to boredom and repetition. Such cognitive and affective motivational responses are essential in encouraging lifelong physical activity behaviours and future research should attempt to establish a way of fostering such motivational responses through the implementation of mastery teaching styles in PE.

Behavioural analysis of the individual TARGET structures revealed significantly higher pupil authority in the reciprocal and guided discovery style lessons when compared to the command/practice style. Consistent with this finding and with Ames's (1984) research on autonomy in the classroom, positive affect associated with ownership of the decision-making process was clearly illustrated in the focus group responses to the authority structure of the reciprocal style, where 30 percent of pupils commented that they 'enjoyed teaching each other'. In contrast one pupil actually stated that 'we had no opportunity to make decisions' during the command/practice style.

Further comparisons between the behavioural and focus group findings for the individual TARGET structures revealed a similarly positive response to the greater flexibility of time to practise in the reciprocal style lessons. In contrast, the lack of flexibility in the command/practice and guided discovery style lessons was considered to be a negative aspect of those styles.

It is acknowledged that the adopted method of standardizing a different athletic event for each of the teaching styles may have impacted upon pupils' cognitive and affective responses and the teaching behaviours. However, pupils were specifically instructed to consider the way the lesson was taught rather than the content of the lesson when recording their focus group responses. Furthermore, had all four lessons been on sprinting, for example, the influence of the activity would potentially have been much greater on the pupils' motivational responses due to the amount of repetition. As stated in the method section, this would have been particularly evident if pupils did not enjoy that activity and when pupils were aware that the other pupils in

the same year group were experiencing a much broader range of activities. That said, future research should try and establish an ecologically valid method of evaluating the motivational effects of different teaching styles using the same lesson content.

In summary, the more pupil centred reciprocal and guided discovery PE teaching styles resulted in more mastery focused teacher behaviours in comparison to the more direct teacher centred command/practice style of teaching. Moreover, pupils' cognitive and affective responses were more adaptive in the more pupil centred styles with a greater focus on learning, improvement, variety and enjoyment and less reference to boredom and repetition. Such cognitive and affective motivational responses are essential in encouraging lifelong physical activity behaviours (Biddle and Chatsizarantis, 1999; Whitehead, 1994). Based on the findings in this study, physical educators should increase their use of more pupil centred teaching styles in order to create a more mastery involving teaching climate. Moreover, future research should develop ways of fostering a mastery motivational climate through the implementation of pupil centred teaching styles and the development of a mastery intervention programme for teacher education.

Appendix 1. Lesson Content

Command/Practice Lesson

Warm up – jog around track (**whole class**)
Stretching (**command/practice style**)
Running drills/strides (**command/practice style**)
Timed run – in groups (**command/practice style**)
Record times.

Reciprocal Lesson

Warm up (**small groups**) – pupil lead pulse raising activities, stretching and sprint drills from resource sheets (**reciprocal style**).

In pairs – pupils teach a sprint start to each other using reciprocal checklists to evaluate and improve technique (**reciprocal style**).

Individual timed runs over 20m focusing on technique – **work in 4s (starter, timekeeper, runner, coach)**. Receive feedback to improve technique and time in subsequent sprints (**reciprocal style**).

Class discussion on starting technique.

Guided Discovery Lesson

Warm up (**small groups**) using weighted balls if available/or footballs – design own pulse raising, push type throwing activities and upper body and leg stretches/ exercises (**Guided discovery style**).

Progressive throws using shot put guided discovery resource sheets (**Guided discovery style**):

- Standing put facing forward – no use of legs
- Standing put facing forward – use of legs
- Standing put facing sideways – use of legs and a closed stance
- Standing put facing sideways – use of legs and an open stance
- Focus on 40–5 degree release angle
- Focus on fast speed of release
- Side shift into the put
- Liner glide starting facing away from the direction of the throw

Teacher command on when to throw and collect (**Command style**).

Record distances for each put (measured by reference to 1m marker cones on the side of the throwing sector) and work out the most important aspects of technique for distance (**Guided discovery style**).

Q & A session to discuss the most important aspects of technique (**Guided discovery style**).

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