



# Goal orientations, self-determination and pupils' discipline in physical education

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In this study, we examined the patterns of goal orientations, perceived competence, reasons for behaving well and self-reported discipline in school physical education among 511 pupils from years 8 and 9 (mean age 14.2 years). Cluster analyses were conducted on two randomly split subsamples to identify homogeneous groups of pupils on these measures of achievement motivation and discipline. Three meaningful clusters emerged for the first subsample, which were then cross-validated for the second subsample. One group of pupils revealed low scores on task and ego orientations, perceived competence and feelings of self-determination about their behaviour in lessons. These perceptions were related to lower ratings of discipline in physical education than pupils who scored more highly on these variables. The highest discipline scores were reported by pupils with high task and ego orientations, perceived competence and feelings of autonomy. The results are useful for teachers and other physical activity leaders in enhancing motivation and disciplined behaviour in young people. Promoting more self-determined reasons for being disciplined, for example, could lead to more orderly classes.

*Keywords:* discipline, goal orientations, physical education, self-determination.

## Introduction

Considerable research in recent years has tested goal perspectives theory in the physical domain. This framework was developed and tested initially within the realm of educational psychology (Dweck, 1986; Nicholls, 1989; Ames, 1992) and has provided valuable insight into children's achievement motivation in academic environments. Most studies in physical settings have been based within competitive sport, using self-selected samples of participants, whereas relatively less attention has been paid to school-based physical education (PE) (Duda and Whitehead, 1998). The day-to-day PE class is likely to contain a wider spectrum of abilities and interests in physical activity (Auweele *et al.*, 1999). In addition, research into motivation for physical activity using goal theory has primarily concentrated on cognitive, emotional and behavioural indices relative to *achievement*, although there is increasing recognition that this theoretical perspective is useful in examining other educational and sport issues (Duda *et al.*, 1991; Dunn and Dunn, 1999). In this vein, the present

investigation was concerned with the links between goals and pupils' self-reported discipline in PE lessons.

Much of the goal perspectives research to date has centred on the role of two different ways of judging competence and defining success in achievement contexts; these have been termed task and ego goals. When individuals adopt task-related goals, they are concerned with personal improvement and feel successful after high effort and mastery of a task. On the other hand, when individuals adopt ego-related goals, they are concerned with social comparison and feel successful after the demonstration of normative superiority or equal performance with less effort. More recently, Elliot and colleagues have proposed two types of task goals ('mastery-approach' and 'mastery-avoidance') and two types of ego goals ('performance-approach' and 'performance-avoidance') within a 2 × 2 framework. These four goals differ in the definition of competence that is operative (personal improvement or normative comparison) and in whether competence is viewed as a positive, desirable possibility (success) or a negative, undesirable possibility (failure) (see Church *et al.*, 2001; Elliot and McGregor, 2001).

Task and ego goals vary across individuals and contexts. Individuals can be more or less task-oriented

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and ego-oriented; environments created by teachers, coaches and parents can be perceived to be more or less task-involving and ego-involving (Nicholls, 1989). From an achievement perspective, high task orientation (either singly or in combination with high ego orientation) has been linked with a range of adaptive motivational responses, including a belief that success stems from hard work and effort rather than innate talent. According to Nicholls, negative cognitions (e.g. ability viewed as a relatively fixed trait), feelings (e.g. state anxiety) and behaviours (e.g. withdrawal of effort) are predicted to occur when individuals are ego-involved and have doubts about their competence, because they will perceive that their goal (normative superiority) will not be fulfilled (for a review, see Duda and Hall, 2001).

Task and ego orientations in sport and physical education have been shown to be largely independent constructs. Consequently, an individual may possess strong task *and* ego orientations, weak task *and* ego orientations, or a dominant orientation (i.e. task *or* ego orientation). Investigators have assigned study participants to one of these four goal profile groups in two ways. First, researchers have used a median or mean split in task and ego scores (e.g. Fox *et al.*, 1994). Secondly, cluster analysis has been used to determine groups of individuals with homogeneous combinations of task and ego orientations (e.g. Hodge and Petlichkoff, 2000; Vlachopoulos *et al.*, 2000; Wang and Biddle, 2001).

A major avenue of enquiry into the correlates of task and ego goals, either singly or in combination, has been establishing their links with intrinsic motivation in physical activity. Intrinsic motivation is motivation to do something for its own sake in the absence of any external rewards. Conceptually, it is argued that high task orientation should correspond to greater feelings of intrinsic motivation, whereas ego orientation is more likely to decrease the willingness to engage in a task for its own sake. In the latter case, physical activity is presumed to serve as a means to an end – that is, to demonstrate normative superiority. On the other hand, when task-involved, a person focuses on mastering a task through active engagement and high effort and, therefore, is concerned with the intrinsic facets of physical activities (Dweck, 1986; Nicholls, 1989). Studies in the physical domain have supported these theoretical propositions (e.g. Goudas *et al.*, 1994a,b; Duda *et al.*, 1995).

Much research into intrinsic motivation in physical activities has used self-determination theory (Deci and Ryan, 1985, 1991) to gain a better understanding of the reasons individuals possess for engaging in such pursuits. Self-determination theory is concerned with the process of internalization, whereby behaviours that

are not intrinsically motivated initially (i.e. extrinsically regulated) are ‘taken in’ by the individual and regulated by more internal processes. Three different types of extrinsic motivation are proposed, which reflect the person’s perceived autonomy for involvement in the task. The least self-determining form of regulation deals with *external* rewards and constraints. In a PE context, children may take part because of perceived teacher rewards, threats or to comply with school rules. *Introjected* regulation refers to behaviour that is internally controlled but not self-determined; children do not identify with, or fully accept, the value of the behaviour. Pupils may participate because they feel they ought to or because they seek social approval. *Identified* behaviours are high in self-determination. Here, pupils may take part in PE because they want to and because they value the outcomes of the learning activities, for example improving skills, fitness and body image. Hence, behaviours are acted out of choice, but remain instrumental.

*Intrinsically* motivated behaviour is apparent if pupils want to do PE solely for its own sake and inherent feelings of fun and satisfaction. Although not explored in the present study, theoretical developments have recently focused on three types of intrinsic motivation: intrinsic motivation ‘to know’, ‘to accomplish’ and ‘to experience stimulation’ (Vallerand, 1997).

In addition to intrinsic motivation and the three types of extrinsic motivation proposed by self-determination theory, motivation theorists have been concerned with the concept of *amotivation*, whereby there may be no perceived reason for engaging in a behaviour, as well as feelings of inadequate ability and helplessness (Pelletier *et al.*, 1995; Vallerand, 1997; Vallerand and Fortier, 1998). This perspective may prove useful in understanding children’s motivation in school settings in which they are compelled to undertake certain activities.

Ryan and Connell (1989) argued that correlations among amotivation, types of extrinsic regulation and intrinsic motivation should reveal a simplex-like or ordered pattern. This is because the distinct classes of reasons for undertaking a behaviour can be meaningfully located along a continuum of autonomy. Therefore, correlations between adjacent scales are maximum and positive, and there is a reduction in the size of correlations for more distant scales, with scales at the opposite ends being unrelated or negatively correlated. These regulations can be combined into a ‘relative autonomy index’ by weighting each scale. The relative autonomy index represents the continuum of autonomy or perceived locus of causality. Positive scores denote more self-determined behaviours, whereas negative scores indicate more controlling regulation (Ryan and Connell, 1989). Studies conducted in the physical

domain have lent support to the motivationally adaptive consequences of more self-determined types of regulation, including intention to participate in physical activity (Goudas *et al.*, 1994a) and higher physical self-worth (Wang and Biddle, 2001).

Both self-determination theory and goal perspective theory postulate links between motivational outcomes and individuals' perceptions of competence, albeit from different standpoints. A major tenet of self-determination theory is that humans need to feel a sense of competence and any event that promotes such feelings is argued to increase intrinsic motivation. On the other hand, events that elicit feelings of incompetence will decrease intrinsic motivation (Deci and Ryan, 1985). In goal perspective theory, however, motivational outcomes are influenced by the criteria used to define competence. Task orientation is likely to promote a sense of *self-referenced* competence and lead to adaptive motivational patterns. Ego orientation, when coupled with confidence about one's abilities in a *normative* sense, is also argued to result in positive consequences. However, motivational difficulties are likely to occur when ego orientation and doubts about one's competence are salient (Dweck, 1986; Nicholls, 1989).

The links between goal perspectives, feelings of autonomy, perceived competence and children's self-reported behavioural conduct in physical settings have received little attention from motivation researchers. In the context of physical education, there are few research data on children's behavioural conduct and on the links between conduct and learning outcomes, although this is now being addressed to a limited extent (Hardy *et al.*, 1994; Hardy, 1999). Physical educationalists have, however, put forward ideas and advice for new and experienced teachers on how to maintain class control and discipline, based on the premise that an orderly atmosphere underpins an effective learning and teaching environment (see Mawer, 1995). These ideas, arguably, tend to focus on short-term strategies and concentrate on notions of 'with-it-ness' and the use of rewards and punishments; they fail to consider children's perceptions of why they should behave well. Hellison (1995), on the other hand, has proposed that teachers should help to instil in pupils a sense of caring and responsibility for others, which should contribute to a well-disciplined and safe environment. Although this approach hints at notions of pupils' autonomy for their conduct, it does not draw on the tenets of self-determination theory to understand the internalization of pupils' reasons for behaviour.

One study has examined the correspondence between goal orientations, feelings of autonomy and pupils' behaviour in physical education. In the context of PE lessons in Greece, Papaioannou (1998) found that pupils' task orientation was positively associated with

more self-determined reasons for behaving well. Moreover, task orientation, together with more self-determined reasons for behaviour (as calculated using the relative autonomy index), predicted children's self-reported discipline. Ego orientation, however, was positively related to external reasons and amotivation and did not predict discipline. Reasons for behaving well in PE lessons were measured using the Reasons for Discipline Scale, developed by Papaioannou and adapted from the work of Ryan and Connell (1989) and Vallerand and his colleagues (Vallerand *et al.*, 1992, 1993).

Papaioannou has argued that task orientation promotes identified and intrinsic reasons for being disciplined in PE classes, since pupils will be prone to concentrate on aspects of skill development, affiliation and fun. They cannot achieve these goals if they misbehave and a disorderly environment exists. Task-oriented, rather than ego-oriented, pupils are more likely to consider learning an important and enjoyable process. Thus, task-oriented pupils should not feel obliged to be quiet or follow rules because they really want to learn, to cooperate with other pupils and to develop a sense of responsibility. Ego orientation promotes an external locus of causality, in that children's reported reasons for behaving appropriately are more controlling, for example because of fear of teacher-imposed punishments.

The aim of the present study was to examine further links between children's achievement motivation and discipline using goal perspective and self-determination approaches. We wished to determine the factorial validity of the Reasons for Discipline Scale using confirmatory factor analytic procedures with a sample of English school pupils in PE. However, our main focus was to determine whether variations within individuals in terms of achievement goal orientations, self-determination and perceived competence are related to pupils' reported discipline in PE. That is, we wished to identify subgroups of pupils based on these motivational variables to determine whether differences in discipline exist. The limited research in this area to date has examined motivational variables separately (Papaioannou, 1998). Identifying similar groups of individuals may promote the effectiveness of interventions designed to improve pupils' behaviour (Wang and Biddle, 2001).

## Methods

### *Participants and procedure*

Altogether, 511 pupils (240 males, 271 females), attending six comprehensive schools in the East

Midlands, completed questionnaires under quiet classroom conditions. The pupils were drawn from school years 8 and 9 and ranged in age from 12 to 14 years ( $14.2 \pm 0.5$  years; mean  $\pm$  s). They were representative of diverse socioeconomic backgrounds and ethnic origins. The participants were informed that there were no right or wrong answers, assured of the confidentiality of their responses and encouraged to ask questions if necessary. Data collection took about 15 min. Permission for the study was granted by the headteachers and heads of PE departments; no pupil refused to take part.

### Measures

**Goal orientations.** The Task and Ego Orientation in Sport Questionnaire (TEOSQ; Duda and Nicholls, 1992) was used to determine pupils' proneness for task and ego involvement in physical education lessons at their school. The TEOSQ has been used extensively in investigations underpinned by achievement goal theory and possesses sound psychometric properties (Duda and Whitehead, 1998). The stem for all items was modified to, 'I feel most successful in physical education when . . .', for the purposes of the present study, and pupils responded on a 5-point Likert scale (5 = strongly agree, 1 = strongly disagree). Cronbach's alpha coefficients for task and ego orientation were 0.82 and 0.86 respectively.

**Perceived competence.** Pupils' perceptions of competence in PE activities were determined using an adapted version of the Sport Competence subscale of the Physical Self-Perception Profile (Fox and Corbin, 1989). Items referred to 'pupils' and 'PE activities' rather than 'kids' and 'sports'. Responses were made on a 5-point Likert scale as above. This instrument has become a popular measure of individuals' perceptions of physical ability, confidence to join in, and ability to learn, physical activities. In the present study, principal components analysis of the six items revealed one factor that accounted for 56.3% of the variance, which demonstrated strong internal reliability ( $\alpha = 0.83$ ).

**Reasons for Discipline Scale.** This instrument assesses pupils' reasons for behaving well in PE lessons. It was developed by Papaioannou (1998) using the scales introduced by Ryan and Connell (1989) and by Vallerand and colleagues (Vallerand *et al.*, 1992, 1993). The Reasons for Discipline Scale examines individuals' reasons for acting along an intrinsic-extrinsic continuum. Specifically, it measures intrinsic, identified, introjected and external reasons for behavioural conduct, together with amotivation (or no reasons for discipline). In the present study, items from the intrinsic,

identified, introjected and external subscales were preceded by the stem, 'When I behave well in physical education lessons, it's because . . .', and pupils responded using a 5-point scale as above. Example items included: 'The PE lesson is exciting' (intrinsic), 'I want to learn new skills and games' (identified), 'I will feel ashamed if I don't' (introjected) and 'So that the PE teacher won't shout at me' (external). Amotivation (e.g. 'I don't see why I should behave well in PE lessons') was assessed by three items. Three subscales possessed alpha coefficients above 0.70 (intrinsic = 0.93, identified = 0.76, introjected = 0.72). External (0.67) and amotivated (0.64) were marginally less reliable.

**Discipline.** A self-reported measure gauged pupils' feelings about their standard of behaviour in school PE lessons. Consistent with previous research using this measure (Papaioannou, 1998), participants responded to two items – 'Do you behave well in PE lessons?' and 'How often do you behave well in PE lessons?' – using a 7-point Likert scale (very much/always = 7, not at all/never = 1). These two items were found to be highly positively correlated ( $r = 0.76$ ,  $P < 0.001$ ) and, consequently, were averaged for use in later analyses. In addition to the self-report measure, PE teachers' ratings of pupils' behaviour were obtained for a subsample of the study's participants ( $n = 149$ ). Specifically, two members of staff from one school responded to the item, 'How well does [*pupil name*] behave in your PE lessons?' A 7-point scale was used, anchored by very much (7) and not at all (1). The teachers agreed upon their rating of pupils' behaviour in all cases. The correlation between teachers' and pupils' responses was  $r = 0.50$  ( $P < 0.001$ ), indicating moderate correspondence.

## Results

### Validity of the Reasons for Discipline Scale

Initial data analyses tested the factor structure of the Reasons for Discipline Scale. This was examined with confirmatory factor analysis using EQS for Windows version 5.7 (Bentler and Wu, 1998). Confirmatory factor analysis examines the *a priori* factor structure of a measurement model and evaluates whether this model fits a data set (observed model). The adequacy of a model can be examined using indices of fit provided by EQS. However, the fit indices are indications of overall fit of the model to the data and do not specify the possible misfit of individual items. Therefore, the factor loadings and error variances were also examined.

The means for the 18 items ranged from 1.84 to 4.04. The standard deviations indicated adequate variability

for all the items, ranging from 0.87 to 1.29. The univariate statistics indicated that the values for skewness and kurtosis were within the range of  $-1.0$  to  $+1.5$ . Mardia's coefficient was 88.4 and the normalized estimate was 35.5, indicating the possibility of multivariate non-normality. Consequently, the robust maximum likelihood method, which controls for the overestimation of chi-square, underestimation of adjunct fit indices and underestimation of errors, was used (Bentler, 1995).

The following indices of fit provided by EQS were therefore examined to evaluate the adequacy of the model: standardized root mean squared residual (SRMR), root mean squared error of approximation (RMSEA), Bentler-Bonett non-normed fit index (NNFI) and robust comparative fit index (CFI). Hu and Bentler (1999) recommend a cut-off value of close to 0.08 for the standardized root mean squared residual, 0.06 for the root mean squared error of approximation and 0.95 for both the non-normed fit index and the robust comparative fit index.

Of the five proposed subscales of the Reasons for Discipline Scale, identified reasons for discipline were most strongly endorsed in this sample ( $3.77 \pm 0.67$ ), followed by intrinsic reasons for behaviour ( $3.50 \pm 1.16$ ), external reasons ( $3.28 \pm 0.75$ ), introjected reasons ( $2.91 \pm 0.87$ ) and amotivation ( $2.14 \pm 0.82$ ).

The measurement model of the Reasons for Discipline Scale, with covariances between all factors permitted, yielded a satisfactory fit to the observed data according to criteria specified by Hu and Bentler

(1999) (Satorra-Bentler scaled  $\chi^2 = 230$ , d.f. = 125,  $\chi^2/\text{d.f.} = 1.84$ , NNFI = 0.934, robust CFI = 0.954, SRMR = 0.057, RMSEA = 0.053, confidence interval for RMSEA = 0.045, 0.061). Inspection of the factor loadings indicated that all the loadings were significant and at least moderate in size, ranging from 0.39 to 0.95 (see Table 1). Among the 18 items, two had loadings that were less than or equal to 0.40 (#3 and #9). The standardized residuals were all lower than 0.20. When the confirmatory factor analysis was repeated with these two items deleted, the fit statistics did not show a marked improvement (Satorra-Bentler scaled  $\chi^2 = 184$ , d.f. = 94,  $\chi^2/\text{d.f.} = 1.96$ , NNFI = 0.938, robust CFI = 0.959, SRMR = 0.053, RMSEA = 0.057, confidence interval for RMSEA = 0.047, 0.066). Therefore, the hypothesized 18-item, 5-factor model was retained in subsequent analyses.

To establish the relationships among the subscales of the Reasons for Discipline Scale, we examined the intercorrelation matrix between the latent factors (see Table 2). The matrix is somewhat supportive of a simplex-like pattern because the magnitude of correlations is greater between adjacent variables and there is a gradual reduction in the magnitude of correlations between variables further away on the continuum. These findings provide additional support for the factorial validity of the Reasons for Discipline Scale. Consequently, in line with procedures recommended by Vallerand and Losier (1999), a relative autonomy index was calculated as follows:

**Table 1.** Standardized factor loadings and error variances of the Reasons for Discipline Scale

Subscale	Item	Factor loading	Error variance
Amotivation	#3 I really don't know why I behave well	0.39	0.92
	#7 I don't see why I should behave well	0.65	0.76
	#11 I really feel it's a waste of time behaving well	0.80	0.60
External	#2 That's what I am supposed to do	0.60	0.80
	#6 So that the teacher won't shout at me	0.56	0.83
	#10 That's the rule	0.76	0.65
	#14 So others won't get annoyed with me	0.47	0.88
Introjected	#4 I will feel bad about myself if I don't	0.72	0.70
	#8 I will feel ashamed if I don't	0.73	0.68
	#12 It bothers me when I don't	0.61	0.79
Identified	#1 I want to follow the lesson	0.57	0.82
	#5 I want to learn new skills and games	0.74	0.68
	#9 To understand what I am doing right or wrong	0.40	0.93
	#13 It's important for me to do well	0.69	0.72
	#15 I want to improve my skills	0.74	0.68
Intrinsic	#16 The PE lesson is fun	0.91	0.42
	#17 I enjoy the PE lesson	0.95	0.31
	#18 The PE lesson is exciting	0.85	0.52

$$\text{amotivation} \times (-2) + (\text{external reasons} + \text{introjected reasons})/2 \times (-1) + \text{identified reasons} \times (+1) + \text{intrinsic reasons} \times (+2)$$

Positive scores indicate an internal perceived locus of causality, whereas negative scores denote an external perceived locus of causality.

*Descriptive statistics*

Table 3 shows the descriptive statistics and intercorrelations between variables. Mean scores indicate that participants had a moderately low task orientation, moderate perceived competence and a positive rating of discipline. Task orientation was moderately correlated with perceived competence and the relative autonomy index. Perceived competence was positively correlated with ego orientation and the relative autonomy index. In addition, pupils' self-ratings of discipline were moderately correlated with the relative autonomy index (all  $P < 0.001$ ).

*Cluster analysis*

To identify subgroups of pupils based on achievement goals, self-determination and perceived competence, two cluster analyses were performed. First, the sample was randomly split into half. For the first subsample ( $n = 213$ ), we used a hierarchical clustering method. However, because this analysis was exploratory, it was important to examine whether the solution could be

**Table 2.** Correlation matrix of the subscales of the Reasons for Discipline Scale

Subscale	1	2	3	4
1. Amotivation				
2. External	-0.02			
3. Introjected	-0.08	0.47*		
4. Identified	-0.40*	0.33*	0.36*	
5. Intrinsic	-0.38*	0.12*	0.22*	0.74*

\*  $P < 0.001$ .

replicated by confirming it with an independent sample. Therefore, a  $k$ -means cluster analysis was carried out with the second subsample ( $n = 215$ ) to confirm the clusters identified in the first analysis.

The cluster analyses were conducted with four variables: goal orientations (task and ego), relative autonomy index and perceived competence. Before the cluster analyses were performed, all the variables were standardized using  $Z$ -scores (mean of 0 and standard deviation of 1). This was because the relative autonomy index used different scales from the other variables. Standardization prevents variables measured in larger units contributing more towards the distance measured than the variables measured in smaller units (Everitt, 1993). Three outliers were removed using the criteria of  $\pm 3$  standard deviations based on standardized scores.

In the hierarchical cluster analysis, squared Euclidean distance was used as the distance measure and Ward's method was used to minimize within-cluster differences and problems with long, snake-like chains found in other methods, such as the single-linkage procedure (Aldenderfer and Blashfield, 1984). The agglomeration schedule and dendrogram were used to identify the number of clusters. These suggested a three-cluster solution to be suitable (see Fig. 1).

*Profiles of cluster groups.* Figure 1 shows the profiles for the three-cluster solution of the hierarchical cluster analysis using subsample A. The first cluster, labelled 'low task/low ego', contained 89 pupils. Specifically, these pupils possessed relatively low task orientation, low ego orientation, low perceived competence and a low relative autonomy index (all below  $Z = -0.5$ ). The second cluster had high scores on task and ego orientations, perceived competence and the relative autonomy index. This cluster was labelled 'high task/high ego' and consisted of 54 pupils. Finally, the third cluster, labelled 'moderate task/moderate ego', consisted of 70 pupils and showed a relatively flat profile, depicting scores within the  $+0.5$  to  $-0.5$   $Z$ -score range. In the  $k$ -means cluster analysis using subsample B, three similar clusters were found, with 67 pupils in cluster 1, 50 pupils in cluster 2 and 98 pupils in cluster 3 (see Fig. 2).

**Table 3.** Descriptive statistics and intercorrelations between variables

Variable	Mean $\pm$ s	1	2	3	4
1. Task orientation	3.68 $\pm$ 0.67				
2. Ego orientation	2.63 $\pm$ 0.90	0.27*			
3. Perceived competence	2.89 $\pm$ 0.92	0.45*	0.37*		
4. Relative autonomy index	3.41 $\pm$ 3.52	0.51*	0.12*	0.51*	
5. Discipline	5.76 $\pm$ 0.96	0.27*	0.05	0.12*	0.29*

\*  $P < 0.001$ .

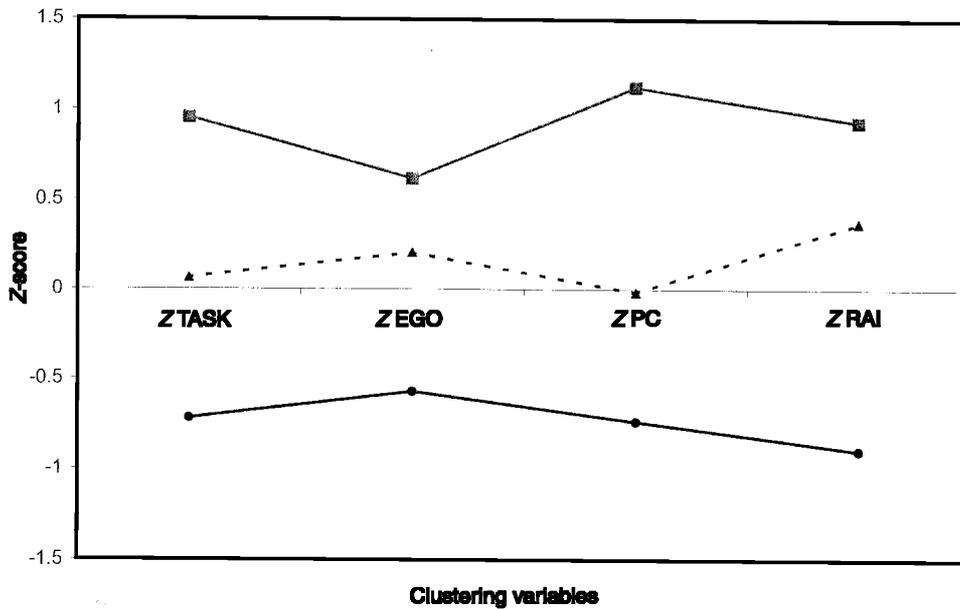


Fig. 1. Cluster profile obtained by hierarchical cluster analysis: subsample A. Cluster 1 (●) = low task/low ego; Cluster 2 (■) = high task/high ego; Cluster 3 (▲) = moderate task/moderate ego. PC = perceived competence; RAI = relative autonomy index.

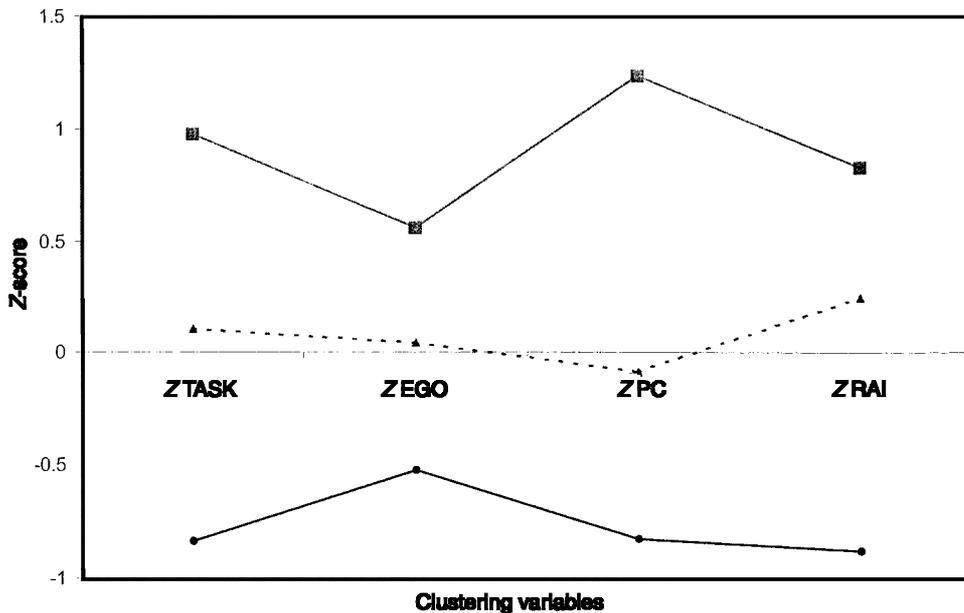


Fig. 2. Cluster profile obtained by *k*-means cluster analysis: subsample B. Cluster 1 (●) = low task/low ego; Cluster 2 (■) = high task/high ego; Cluster 3 (▲) = moderate task/moderate ego. PC = perceived competence; RAI = relative autonomy index.

Table 4 shows the cluster means, standard deviations and Z-scores for the solutions obtained by both methods.

To determine whether these three cluster profiles differed in amount of discipline, the samples were combined from the two clustering methods and subjected to a one-way analysis of variance using pupils' self-ratings

of discipline as the dependent variable and cluster membership as the independent variable. We combined corresponding clusters from the two samples given the high similarity in scores. The largest discrepancy in any mean score was 0.35 (cluster 2 relative autonomy index scores), with most less than 0.1. Self-reported discipline was used as a dependent variable in this analysis given

**Table 4.** Cluster means, standard deviations and *Z*-scores for the three-cluster solution of the randomly split sample

Subsample A	Cluster 1 ( <i>n</i> = 89)		Cluster 2 ( <i>n</i> = 54)		Cluster 3 ( <i>n</i> = 70)	
	Mean ± <i>s</i>	<i>Z</i>	Mean ± <i>s</i>	<i>Z</i>	Mean ± <i>s</i>	<i>Z</i>
Task orientation	3.20 ± 0.65	-0.72	4.32 ± 0.40	0.96	3.72 ± 0.41	0.06
Ego orientation	2.11 ± 0.63	-0.57	3.18 ± 0.84	0.62	2.81 ± 0.97	0.20
PC	2.21 ± 0.70	-0.74	3.91 ± 0.65	1.12	2.87 ± 0.62	-0.02
RAI	0.24 ± 2.87	-0.90	6.68 ± 2.01	0.93	4.71 ± 2.30	0.37

Subsample B	Cluster 1 ( <i>n</i> = 67)		Cluster 2 ( <i>n</i> = 50)		Cluster 3 ( <i>n</i> = 98)	
	Mean ± <i>s</i>	<i>Z</i>	Mean ± <i>s</i>	<i>Z</i>	Mean ± <i>s</i>	<i>Z</i>
Task orientation	3.12 ± 0.56	-0.83	4.33 ± 0.39	0.98	3.75 ± 0.49	0.10
Ego orientation	2.16 ± 0.79	-0.52	3.13 ± 0.84	0.56	2.67 ± 0.82	0.04
PC	2.13 ± 0.60	-0.82	4.02 ± 0.55	1.24	2.81 ± 0.53	-0.08
RAI	0.31 ± 2.98	-0.88	6.33 ± 2.35	0.83	4.27 ± 2.15	0.25

Abbreviations: PC = perceived competence; RAI = relative autonomy index.

**Table 5.** Pupils’ discipline by cluster (mean ± *s*)

	Rating of discipline
Cluster 1 ( <i>n</i> = 156)	5.48 ± 1.14 <sup>a</sup>
Cluster 2 ( <i>n</i> = 104)	6.19 ± 0.64 <sup>b</sup>
Cluster 3 ( <i>n</i> = 168)	5.81 ± 0.77 <sup>c</sup>

Note: Means in the same column that do not share superscripts differ at *P* < 0.005 in Tukey’s HSD comparisons.

our research question and to provide a test of the external validity of the cluster groupings.

The results showed significant differences between the three clusters on the dependent measure ( $F_{2,425} = 19.6, P < 0.001, \eta^2 = 0.08$ ). *Post-hoc* tests using Tukey’s Honestly Significant Difference test revealed that the ‘low task/low ego’ cluster (cluster 1) had significantly less discipline than the other two clusters (*P* < 0.01). In addition, the ‘high task/high ego’ cluster (cluster 2) had significantly higher ratings of discipline than the ‘moderate task/moderate ego’ cluster (cluster 3) (*P* < 0.01). Table 5 presents the means and standard deviations of the pupils’ self-rating of discipline by cluster.

## Discussion

Understanding children’s and adolescents’ motivation for physical education and its possible impact on behavioural conduct should be of value from both theoretical and practical viewpoints. The main aim of the present study was to examine the patterns of achievement goals, feelings of competence in physical education and regulation of behaviour within school

pupils from years 8 and 9, and to determine their association with self-reported discipline in PE lessons. Thus, in line with recent research on the determinants of young people’s participation in physical activity (e.g. Wang and Biddle, 2001), we examined the links between important theoretical motivational variables – acting in combination rather than in isolation – and pupils’ discipline in PE. Previous research into achievement motivation and discipline has examined the separate influence of goal orientations and feelings of self-determination, but has not determined how these variables combine with pupils’ perceptions of competence in PE to influence reported discipline (Papaioannou, 1998).

A secondary aim of our study was to establish the factorial validity of the Reasons for Discipline Scale, developed by Papaioannou (1998) and adapted for this study. Confirmatory factor analysis supported the overall fit of the hypothesized structure of the scale to the data. However, reliability coefficients were marginal for external and amotivation subscales. Confirmatory factor analysis also revealed that two items had relatively low loadings and high error variances. These were from the amotivation subscale (‘I really don’t know why I behave well’) and the identified subscale (‘To understand what I am doing right or wrong’). The internal consistency and adequacy of these subscales of the English version of the Reasons for Discipline Scale could be improved in future research by increasing the number of items and adjusting the vernacular of their language.

The participants in the present study reported moderately low task orientation in comparison to previous studies with similar age groups (Duda and Whitehead,

1998). Pupils also reported moderate perceived competence in PE and fairly positive ratings of their behaviour. In terms of regulation of discipline, they endorsed identified and intrinsic reasons for good behaviour more strongly than less self-determined reasons. More autonomous reasons were positively correlated with pupils' task orientation and sense of competence in PE. It is promising that pupils endorsed identified and intrinsic regulations, since more autonomous reasons for acting are predicted to lead to adaptive motivational and behavioural consequences (Vallerand, 1997; Vallerand and Losier, 1999; Ryan and Deci, 2000). Clearly, however, further research is needed to substantiate the reasons pupils give for their 'good' conduct in PE lessons, and to establish reasons for 'bad' behaviour and their motivational implications.

The regulation of behavioural conduct in PE, as determined by the Reasons for Discipline Scale, was converted in the present study into an autonomy index and combined with key motivational variables drawn from goal perspective theory (Nicholls, 1984, 1989). We then looked at the profile of these psychological variables within individuals. Our results show that different subgroups can be identified regarding the complex pattern of goals, perceived competence and behaviour regulation within PE, and signify that qualitatively different perceptions of achievement and regulation of disciplined behaviour exist.

One group (cluster 1) reported relatively low scores for task and ego orientations and for perceived competence in PE. These self-perceptions were linked with low feelings of self-determination of conduct in lessons. These pupils also rated their discipline in PE significantly lower than pupils in clusters 2 and 3. Another group (cluster 2) possessed a very different profile, in that these children strongly endorsed both task and ego orientations, were confident in their abilities and had a sense of autonomy about their behaviour. This group reported the highest ratings of discipline. The present study also identified a third cluster profile. The children in this group, in comparison with the other two groups, reported moderate scores on these key psychological variables and were found to have lower scores for behaviour than the cluster evidencing the most adaptive motivational profile (cluster 2), but higher discipline scores than the least adaptive profile (cluster 1).

The present findings, therefore, appear to support the link between high task orientation and more self-determined forms of behaviour regulation (Papaioanou, 1998). Task-oriented pupils are more likely to concentrate on learning and improving during lessons, desire an orderly working environment to do so and cooperate with their classmates as part of this process. They are less likely to feel that their conduct is controlled externally by the teacher or by the salience

of wider school rules. The results also suggest that endorsement of ego orientation may not be maladaptive in terms of pupils' self-reported behaviour, especially when combined with high task orientation and feelings of competence (Fox *et al.*, 1994; Wang and Biddle, 2001).

The low self-perceptions of pupils in cluster 1 imply that these children are more 'at risk' from a motivational standpoint. Previous research using cluster analysis has also identified at-risk groups to be those with low self-perceptions (Weiss *et al.*, 1997; Wang and Biddle, 2001). The present findings also demonstrate that children who are not concerned with demonstrating competence, and believe that they lack ability, are also more likely to feel that disciplined behaviour in PE settings is imposed externally. The conduct of these pupils may not be as good as that of others with more positive self-perceptions. Interventions designed to promote perceptions of a task-involving climate, thereby possibly strengthening task orientation, as well as using strategies to increase feelings of perceived competence and self-determination, would seem to be a priority. We might then gain a better understanding of the interdependencies between achievement goals, perceived competence and intrinsic-extrinsic regulation of these pupils' conduct in PE.

## Conclusions

The results of the present study suggest that pupils who endorse both task and ego orientations, and possess a sense of competence in PE, report more self-determined reasons for their conduct in lessons and consider that they behave well nearly all the time. Pupils exhibiting a more negative profile, consisting of low task and ego orientations, low perceived competence and lower feelings of autonomy, rate their conduct lower than their peers.

Future research should seek to substantiate the present findings and, in so doing, overcome limitations of the current approach. Specifically, the cross-sectional design of the study and correlational nature of the results do not allow for causal inferences to be made about the influence of goals, perceived competence and self-determination on discipline in PE. Longitudinal studies and interventions would be a step forward. We also need to move beyond an almost exclusive reliance on self-reported data and obtain teacher perception and observational data. As well as being self-report, the discipline measure used in the present study could be regarded as imprecise in that 'behaving well' is open to different interpretations. Indeed, this could help to explain the modest association between teachers' and pupils' perceptions of discipline reported here.

Furthermore, the external validity of the cluster solutions requires further examination. A central aim of the present research was to determine whether pupil discipline differed between the emergent clusters, but the use of discipline as the sole dependent variable is a limitation. Future validation studies should include teacher perception and observational data on discipline, as well as measures of pupil learning and achievement. Such work could provide insight into the links between regulation of disciplined behaviour and achievement.

Additional research efforts are also needed to determine the factorial structure and reliability of the Reasons for Discipline Scale among English school pupils. Specifically, the psychometric qualities of the external and amotivation subscales require attention. Using samples in which a wider range of discipline ratings is evident could test the structural validity and predictive utility of the scale. Finally, goal perspective theory argues that situational as well as dispositional goals influence the meaning of achievement contexts (Ames, 1992). Thus, future research should examine how the motivational climate of the physical education lesson is linked with pupils' perceptions of teachers' strategies to maintain discipline and to pupils' behaviour (Papaioannou, 1998).

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