



Achievement goal profiles in school physical education: Differences in self-determination, sport ability beliefs, and physical activity

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Background. Physical activity is a major public health issue as trends show inadequate levels of physical activity for health and rising levels of obesity. Understanding motivation for physical activity in youth by assessing their motivational profiles associated with school physical education could inform future interventions.

Aims. To investigate goal orientation and perceived competence profiles in young adolescents and to test the nature of differences between clusters on motivational and physical activity measures.

Sample. Boys ($N = 427$) and girls ($N = 391$), aged 11–14 years, from two comprehensive schools in England.

Method. Cross-sectional survey using cluster analysis.

Results. Clusters reflecting 'highly', 'moderately', and 'lowly' motivated youth were found. Physical activity, incremental sport ability beliefs, and self-determined motivation were highest in the highly motivated cluster. Girls were under-represented in this cluster.

Conclusions. High motivation towards physical activity is characterised by high task and high ego orientation, and high perceived competence. With only 38% of this group being girls, interventions are required to boost motivation for girls based on goal and self-determination approaches.

Physical activity in youth is currently a popular topic in research in both education and health as well as in media coverage. It is an important public health issue because

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regular participation in physical activity for young people is claimed to contribute to the enhancement of physical and psychological well-being (Biddle, Sallis, & Cavill, 1998). In addition, there is concern about the apparent decline in activity in youth and an increase in obesity (Fehily, 1999) and the low levels of physical activity in some youth, particularly girls (Pratt, Macera, & Blanton, 1999). It will come as no surprise, therefore, that much has now been written about the importance of understanding motivational factors associated with physical activity in youth.

The literature on the determinants of physical activity in young people has highlighted a wide range of potentially influential factors. A recent comprehensive review by Sallis, Prochaska, and Taylor (2000) suggests that motivational variables centred on achievement orientation and perceptions of competence are worthy of study. Indeed, achievement goal theory, emanating from educational psychology in the classroom, has been used extensively by sport psychologists to further understanding of motivation in youth in sport and physical education contexts (Biddle, 2001; Duda & Hall, 2001). This study, therefore, analyses goal orientation profiles to assess underlying differences in other motivational constructs and physical activity.

Goal perspectives theory

Research investigating the motivation of children and youth in physical activity has shown the importance of how young people define success (Treasure & Roberts, 1995). Research has identified two perspectives that are reflected in two major achievement goal orientations, namely, task and ego goals. A task orientation defines success or construes competence in terms of mastery or task improvement, thus adopting personal criteria of success evaluation. An ego orientation defines success or construes competence in normative terms, such as through winning or outperforming others.

In sport and physical education, task orientation has been found to be positively associated with various indicators of motivation, including intrinsic motivation (Duda, Chi, Newton, Walling, & Catley, 1995; Goudas, Biddle, & Fox, 1994) and positive affect (Ntoumanis & Biddle, 1999). The relationship between ego orientation and motivational indicators is less clear (Ntoumanis & Biddle, 1999; J. Whitehead, 1995). However, Nicholls (1989) argued that task and ego goals are not mutually exclusive and are largely orthogonal. That is to say that some people may be high in one goal but not the other, while others might be high or low in both. When assessing people's task and ego goal orientations and labelling them as 'high' or 'low' in combination, this has become known as 'goal profiling' (Fox, Goudas, Biddle, Duda, & Armstrong, 1994). Although ego orientation has often been seen as less motivationally adaptive (positive) than a task orientation, research has shown that being ego oriented, *when combined with a high task orientation*, is associated with high motivation (Fox *et al.*, 1994; Wang & Biddle, 2001).

It has been proposed that ego goal orientations interact with perceptions of competence (Nicholls, 1989). It is hypothesised that task oriented individuals, because they are concerned with self-improvement and personal effort, will largely be unaffected by their perceptions of personal competence. However, because ego oriented individuals are concerned with normative ability and other-person referencing, it is hypothesised that they will display higher levels of motivation when perceiving their competence to be high, but low levels of motivation when low in perceived competence. However, while some researchers have found that motivation will be high

for ego-oriented individuals when perceived competence is high (Cury, Biddle, Sarrazin, & Famose, 1997), other studies show no interaction between ego orientation and perceived competence (e.g., Vlachopoulos & Biddle, 1997). Clarification of the motivational differences between individuals varying in goal profiles and perceptions of competence is needed. In addition, with trends supporting higher scores for males than females on perceptions of competence (Lirgg, 1991), ego orientation (Duda & Whitehead, 1998), and physical activity levels (Pratt *et al.*, 1999), gender differences need testing.

Use of related theories

There are many theories of motivation that are likely to inform researchers about the nature of individuals differing in goal profiles. We have chosen two: self-theories of ability (Dweck, 1999) and self-determination theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000b). Both have been shown to be important in understanding motivation in physical activity for young people (Ntoumanis, 2001; Wang & Biddle, 2001).

Self-theories of ability beliefs. Classroom research has shown children to process ability-related information in different ways. Dweck (1999) has discussed conceptions of ability in terms of beliefs about the nature of intelligence, morality and stereotyping. For example, intelligence is seen by some to be relatively fixed and by others to be changeable. Children believing in a more fixed notion of intelligence (an 'entity theory' of intelligence) are more likely to adopt an ego-oriented achievement goal and show less adaptive responses to failure (Mueller & Dweck, 1998). Conversely, children believing that intelligence is changeable (an 'incremental theory' of intelligence) are more likely to adopt a task goal and show positive motivation (Hong, Chiu, Dweck, Lin, & Wan, 1999).

Support for such propositions is now emerging in physical activity. Biddle, Soos, and Chatzisarantis (1999) tested a model predicting intentions from perceived competence, achievement goals, and ability beliefs. They found that for Hungarian youth, entity beliefs predicted an ego goal orientation and incremental beliefs predicted a task orientation. In addition, behavioural intentions were predicted by a task, but not an ego, goal orientation. Assessing the way young people construe the nature of sport ability, in combination with goal orientations, has potential for furthering understanding of motivation.

Self-determination theory. There are different types of behavioural regulations central to self-determination theory, each one reflecting a qualitatively different 'reason' for the behaviour chosen. Assessing behavioural regulations might provide further insight into how people differ in their motivational and goal profiles.

There are three types of extrinsic motivation in studies of youth: external, introjected, and identified forms of regulation. External regulation refers to behaviour that is controlled by external means, such as rewards or external authority. Introjected regulation refers to behaviour that is internally controlled or self-imposed, such as acting out of feelings of guilt avoidance, and is characterised by feelings of internalised pressure, such as 'I ought to ...'. For identified regulation the behaviour is self-determined according to one's choice or values. It is characterised by feelings of 'want' rather than 'ought'. In addition, intrinsic motivation is reflected in behaviour performed solely for its own sake or enjoyment. The four regulations form a continuum that characterises the degree of internalisation of (or reasons for) the behaviour. This is indicated by the Relative Autonomy Index (RAI) calculated by weighting and summing

each subscale when assessed by questionnaire. Positive scores indicate more autonomous ('self-determined') regulation and negative scores indicate more controlling (less or non 'self-determined') regulation. Research has shown the motivational benefits of more self-determined behavioural regulation in physical activity contexts with youth (e.g., Ntoumanis, 2001; Wang & Biddle, 2001).

Finally, the concept of 'amotivation' can sit within a self-determination theory framework (Ryan & Deci, 2000b) and is an important variable in its own right. Amotivation refers to lack of motivation where no contingency between actions and outcomes is perceived and there is no perceived purpose in engaging in the activity (Deci & Ryan, 1985; Ryan & Deci, 2000b). Vallerand and Fortier (1998) suggest that the study of amotivation 'may prove helpful in predicting lack of persistence in sport and physical activity' (p. 85).

The purpose of this study, therefore, was to enhance understanding of youth motivation for involvement in physical activity by analysing goal orientation profiles for differences in sport ability beliefs, self-determination and amotivation. To assess the behavioural impact of any motivational differences emerging, we tested for differences in physical activity levels outside of school lessons. Given the fact that school physical education lessons are compulsory for children in the national curriculum in England and Wales up until the age of 16 years, testing the relationship between motivational perceptions associated with school physical education and related behaviour outside of school is important. Specifically, three research questions were formulated:

- 1) Are there subgroups of pupils with distinct profiles based on goal orientations and perceptions of competence?
- 2) Are there gender differences in these goal profiles?
- 3) What are the characteristics of each goal profile? Specifically, are some goal profiles characterised by more self-determined motivation, higher incremental beliefs, and greater levels of physical activity outside school physical education lessons compared to others?

Method

Participants and procedure

The participants were 824 secondary school students (427 boys, 391 girls; 6 with gender not specified) from two comprehensive schools representative of reasonably diverse socio-economic status in the English Midlands. The students ranged in age from 11 to 14 years ($M = 12.71$; $SD = .87$) and were requested to complete questionnaires administered by the first author. A cross-sectional survey design was employed. Participants were informed that there were no right or wrong answers, assured of the confidentiality of their responses in respect of their teachers and parents, and encouraged to ask questions if necessary. Participants were requested to write their name on their questionnaire to facilitate follow-up if required. Normal ethical procedures were followed and conformed to guidelines of the British Psychological Society.

Measures

Goal orientations

The participants' dispositional goal orientations were measured using the 12-item Perception of Success Questionnaire (POSQ) (Roberts, Treasure, & Balague, 1998). The stem for the 12 items was 'I feel most successful in physical education when ...'. Example items included '... when I work hard' (task) and '... when I am the best' (ego). Answers were given on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) and satisfactory Cronbach alpha coefficients were reported from the present sample for both task ($a = .79$) and ego ($a = .82$) subscales.

Perceived competence

The Sport Competence items from the Children's version of the Physical Self-Perception Profile (PSPP-C; J.R. Whitehead, 1995) were administered. Example items included 'some people feel that they are good when it comes to playing sport in PE' and 'some people are quite confident when it comes to taking part in sports activities in PE'. Responses were given on 5-point scales ranging from 1 (this is not at all like me) to 5 (this is very much like me) and the internal consistency of this subscale for the present sample was satisfactory ($a = .78$).

Sport ability beliefs

The English version of the 'Conceptions of the Nature of Athletic Ability Questionnaire, Version 2' (CNAAQ-2) (Wang & Biddle, 2001) was employed to examine incremental and entity beliefs. Incremental beliefs were assessed through the two subscales reflecting 'Learning' (three items, e.g., 'to be successful in sport you need to learn techniques and skills, and practise them regularly') and 'Improvement' (three items, e.g., 'how good you are at sport will always improve if you work at it'). Entity beliefs were measured through two subscales reflecting 'Stable' (three items, e.g., 'it is difficult to change how good you are in sport') and 'Gift' (three items, e.g., 'to be good in sport you need to be naturally gifted'). Responses were made on 5-point scales, similar to the POSQ.

Psychometric investigation of the CNAAQ-2 (Biddle, Wang, Chatzisarantis, & Spray, 2001; Wang & Biddle, 2001) with a large national sample has shown satisfactory fit indices, invariant across gender and school Years 7, 8 and 9 (CFI = .944–.977; RMSEA = .034–.050), when tested with confirmatory factor analysis. The internal reliability coefficients for incremental beliefs ($a = .73$) and entity beliefs ($a = .71$) were satisfactory for the present sample.

Perceived locus of causality. The Perceived Locus of Causality (PLOC) scale developed by Goudas *et al.* (1994) was used to assess four types of behavioural regulation in the physical education (PE) context. The stem for all items was 'I take part in PE ...'. External regulation (e.g., 'because I'll get into trouble if I don't') and introjection (e.g., 'because I'll feel bad about myself if I didn't') were assessed through four items each. Identification (e.g., 'because I want to improve in sport/PE') and intrinsic motivation (e.g., 'because sport/PE is fun') were measured through three items each. Responses were given on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The scale has been tested and used successfully in prior research with young people (Biddle, Chatzisarantis, & Hagger, 2001; Biddle *et al.*, 1999; Chatzisarantis, Biddle, & Meek, 1997; Wang & Biddle, 2001). Cronbach alphas for external regulation,

introjection, identification, and intrinsic motivation in the present study were .79, .63, .71, and .83, respectively.

Amotivation. Amotivation was assessed by three items modified by Goudas *et al.* (1994) from the Academic Motivation Scale (Vallerand *et al.*, 1992). The stem for the items is 'I take part in physical education and sport ...' (e.g., '... but I really feel I'm wasting my time in sport/PE'). Answers were given on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach alpha was $\alpha = .66$.

Physical activity participation. Assessing physical activity through self-report with young people is fraught with difficulties (Sallis & Saelens, 2000). However, in an effort to improve on prior motivational research that has assessed intentions rather than behaviour (Biddle *et al.*, 1999; Ntoumanis, 2001), a checklist approach to assessing physical activity was adopted. Three items were used to measure the participants' physical activity participation outside school physical education lessons. First, to avoid the problems associated with young people's sporadic nature of activity, they were asked to state how many times per week they exercised or played sport for the past six months (four categories: 'hardly ever/not at all'; 1–2 times per week; 3–4 times per week; more than 4 times per week). In addition, we assessed the duration of time they engaged in these activities per week (four categories: < 1 hour; 1–3; 3–6; more than 6 hours). Answers on these two items were given on 4-point scales. To assess more recent patterns of activity (Welk, Corbin, & Dale, 2000), the third item asked about their present physical activity participation in terms of the number of times per week. This was an open-ended question scored as four categories ('hardly ever/not at all'; 1–2 times per week; 3–4 times per week; more than 4 times per week). Factor analysis of these three items revealed that one factor emerged and accounted for 76.23% of the variance with high factor loadings ranging from .83 to .89. This enhanced our confidence in the validity of the assessment. The mean of three items, on a 4-point scale, was taken to represent physical activity participation ($\alpha = .84$).

Results

Descriptive statistics

The means and standard deviations of the overall sample are shown in Table 1. Generally, pupils had high task orientation, high incremental beliefs and moderately high levels of perceived competence, and they were more likely to have identified or intrinsic regulation for participation in physical education classes. Physical activity participation was moderately high for this group of students. To determine whether significant differences exist between the boys and girls, a MANOVA was conducted with gender as the independent variable and all measured variables as dependent variables. Results showed that significant differences existed between genders on seven of the 11 variables but these differences were small. The results of the significant tests are presented in Table 1 with partial effect sizes (η^2) shown.

Table 2 shows the intercorrelations between all variables. Task orientation was positively correlated with incremental beliefs, identification, intrinsic motivation, perceived competence and physical activity participation, and negatively correlated with amotivation, entity beliefs and external regulation. Ego orientation was positively associated most clearly with perceived competence and introjection.

Table 1. Descriptive statistics for the overall sample, and boys and girls

	Overall (N = 824)		Male (N = 427)		Female (N = 391)		Gender Differences	
	Mean	SD	Mean	SD	Mean	SD	<i>p</i>	η^2
Task	4.14	.61	4.18	.62	4.10	.58	n.s.	.00
Ego	2.83	.80	2.94	.84	2.71	.73	< .001	.02
External	2.42	.94	2.36	.96	2.48	.93	n.s.	.00
Introjection	2.74	.81	2.79	.83	2.68	.79	n.s.	.01
Identified	4.03	.75	4.12	.70	3.94	.79	< .005	.01
Intrinsic	3.97	.87	4.13	.79	3.80	.93	< .001	.03
Amotivation	1.99	.81	1.90	.79	2.10	.83	< .001	.01
Incremental	4.04	.60	4.10	.60	3.99	.60	< .01	.01
Entity	2.35	.71	2.37	.73	2.33	.68	n.s.	.00
Perceived Competence	3.18	.72	3.34	.73	3.01	.67	< .001	.05
Physical Activity	2.70	.84	2.96	.79	2.41	.79	< .001	.11

Table 2. Intercorrelations for all variables

	1	2	3	4	5	6	7	8	9	10
1. Task	—									
2. Ego	.27**	—								
3. Perceived Competence	.28**	.31**	—							
4. Incremental Beliefs	.34**	.14**	.32**	—						
5. Entity Beliefs	-.20**	.15**	.02	.03	—					
6. External	-.23**	.09**	-.06	-.03	.38**	—				
7. Introjection	.06	.26**	.20**	.26**	.30**	.46**	—			
8. Identified	.32**	.10**	.40**	.51**	-.02	-.05	.37**	—		
9. Intrinsic	.35**	.14**	.45**	.45**	-.11**	-.22**	.23**	.67**	—	
10. Amotivation	-.27**	.06	-.27**	-.18**	.33**	.54**	.17**	-.34*	-.44**	—
11. Physical Activity	.28**	.15**	.38**	.11**	-.13**	-.22**	.01	.20**	.27**	-.25**

p* < .005; *p* < .001

Goal profile clustering

To identify subgroups of pupils based on achievement goals and perceived competence, a two-stage clustering method was used (Hair, Anderson, Tatham, & Black, 1998). In general, this involves hierarchical clustering in the first stage. With the aid of an agglomeration schedule and dendrogram, the number of clusters and cluster centres can be determined. In the second stage, the cluster centres are used as the initial seed points in a non-hierarchical method. It is suggested that this two-stage method is more robust in that the k-means clustering method serves as a refinement of the clusters (Punj & Stewart, 1983). In addition, the non-hierarchical method can also verify the results of the hierarchical method (Hair *et al.*, 1998). This is done by using the seed points or centroids determined by the hierarchical method as the initial seed points for the k-means method. If the final centroids in the k-means method are similar to the initial seed points, the results of the hierarchical method are verified.

The cluster analyses were conducted based on dispositional goal orientations and perceived competence. Multicollinearity was not an issue because intercorrelations between the clustering variables were not high. Before the cluster analyses were carried out, all three variables were standardised using Z scores (mean of 0 and a standard deviation of 1). Treatment of outliers involved deleting cases with Z scores of more than 3 in any of the clustering variables. Three cases were deleted using this criterion. An additional 26 cases were deleted due to missing data for at least one of the three clustering variables. In stage one of the analyses, Ward's hierarchical method was preferred as it minimises the within-cluster differences and avoids problems with forming long, snake-like chains found in other methods such as the single-linkage procedure (Aldenderfer & Blashfield, 1984). The agglomeration schedules and dendrograms suggested a three-cluster solution to be suitable because the agglomeration coefficient showed a large increase (38.5%) from three to two clusters. In the second stage, a k-means clustering method was used with the centroid values obtained from stage one as the initial seed points. The final centroid centres obtained are shown in Table 3, and these were similar to the initial seed points.

Table 3. Goal profile clusters

	Cluster 1 (‘Lowly motivated’) (N = 120)			Cluster 2 (‘Moderately motivated’) (N = 362)			Cluster 3 (‘Highly motivated’) (N = 313)		
	Mean	SD	Z	Mean	SD	Z	Mean	SD	Z
Task	3.11	.43	-1.70	4.23	.40	-.14	4.45	.42	.50
Ego	2.32	.54	-.63	2.38	.53	-.57	3.56	.54	.92
Perceived Competence	2.77	.66	-.57	2.93	.63	-.35	3.63	.59	.62

Three distinct clusters were identified. The first was characterised by a low task/low ego/low competence profile (labelled ‘lowly motivated’). The second had a moderate task/low ego/moderately low competence profile (labelled ‘moderately motivated’), while the third cluster with a high task/high ego/high competence profile (labelled ‘highly motivated’). In terms of the proportions of gender in each cluster, the ‘lowly motivated’ had 120 pupils equally distributed between boys and girls. The ‘moderately motivated’ group had 362 pupils, of which 44% were males and 55% were females. The ‘highly motivated’ cluster had 313 pupils with more males (62%) than females (37.5%)

Differentiating goal profile groups

To examine the characteristics of each goal profile cluster according to behavioural regulation and sport ability beliefs, two MANOVAs were conducted. In addition, a separate ANOVA was performed with physical activity participation as the dependent variable for each cluster. This was to test for behavioural differences as a way of testing validity for the psychologically-based clusters.

Self-determination. For the MANOVA testing for differences in external regulation, introjection, identification, intrinsic motivation and amotivation, there were significant differences between the three clusters (Hotelling's $T = .83$, $F(10, 1574) = 15.76$, $p < .001$, $\eta^2 = .09$). Follow-up ANOVA and post-hoc tests using Tukey's Honestly Significance Difference (HSD) were conducted (see Table 4). Those pupils in the highly

motivated group had significantly higher introjection, identified regulation and intrinsic motivation, and significantly lower external regulation and amotivation than those in the lowly motivated group ($p < .001$). The lowly motivated group also had significantly higher external regulation and amotivation and lower identified regulation and intrinsic motivation compared to the moderately motivated group ($p < .001$).

Table 4. Comparisons of goal profile groups

	Cluster 1		Cluster 2		Cluster 3		F value	p value
	'Lowly motivated'		'Moderately motivated'		'Highly motivated'			
	Mean	SD	Mean	SD	Mean	SD		
External	2.79 ^a	.91	2.28 ^b	.86	2.43 ^b	1.01	14.09	< .001
Introjection	2.70 ^a	.75	2.56 ^a	.73	2.99 ^b	.86	24.70	< .001
Identified	3.55 ^a	.85	4.02 ^b	.72	4.26 ^c	.63	43.86	< .001
Intrinsic	3.44 ^a	1.00	3.93 ^b	.82	4.25 ^c	.75	42.06	< .001
Amotivation	2.31 ^a	.85	1.96 ^b	.80	1.89 ^b	.78	11.99	< .001
Incremental Belief	3.66 ^a	.67	4.01 ^b	.57	4.24 ^c	.54	45.58	< .001
Entity Belief	2.62 ^a	.79	2.21 ^b	.63	2.41 ^a	.72	17.04	< .001
Physical Activity	2.28 ^a	.83	2.66 ^b	.79	2.90 ^c	.82	26.33	< .001

Note: Means in the same row that do not share superscripts differ at $p < .001$ using Tukey's HSD.

Sport ability beliefs. For sport ability beliefs, significant differences also existed between the three goal profile groups (Hotelling's $T = .86$, $F(4, 1582) = 31.50$, $p < .001$, $\eta^2 = .07$). Pupils in the highly motivated cluster had significantly higher incremental beliefs compared to the two other profile groups ($p < .001$). In terms of entity beliefs, it was found that there were no significant differences between the lowly motivated and highly motivated clusters but the moderately motivated cluster had significantly lower entity beliefs.

Physical activity. The results of the ANOVA showed that the highly motivated group reported significantly higher physical activity participation compared to the other two groups ($p < .001$). The moderately motivated group was more likely to participate in physical activity compared to the lowly motivated cluster ($p < .001$).

Discussion

The purpose of this study was to further our understanding of motivation for physical activity in youth based on measures associated with the physical education context. Specifically, we ascertained the nature of task and ego goal profile groups, coupled with perceptions of competence, and tested how these groups differed on related motivational and behavioural constructs. The cluster analyses confirmed prior research using this method that has concluded that it is too simplistic to label people as either 'high' or 'low' in motivation (Hodge & Petlichkoff, 2000; Ntoumanis, 2001; Vlachopoulos, Karageorghis, & Terry, 2000; Wang & Biddle, 2001). A note of caution, however, is required prior to further discussion. In using cluster analysis, we have adopted phraseology reflecting *relative* differences between clusters, as depicted using Z scores. However, one might also scrutinise raw scores to judge the 'absolute' meaning of scale scores. This is not without its own difficulties, of course, because we lack true

normative data for scales assessing the motivational constructs chosen for this study. However, it should be noted that, in line with other studies (e.g., Wang & Biddle, 2001), pupils generally do not report low values for task orientation.

From the three clusters, we note that nearly 40% were represented in the highly motivated cluster, and only 15.1% in the low motivated cluster. This suggests, at least for this sample, that the so-called 'moral panic' often portrayed in the media concerning young people's physical activity motivation and participation may be exaggerated. It is noteworthy that this is highly consistent with results from Wang and Biddle's (2001) large national sample. In the present study, the highly motivated cluster displayed the highest activity levels, adding to our confidence concerning the validity and generalisability of the self-reported psychological constructs assessed. In addition, they were self-determined in their motivation and felt that sport ability was clearly changeable ('incremental'). Interestingly, this group was also reasonably high in introjection, suggesting that participation in school physical education was partly motivated by internal pressure, or avoidance of guilt. This might be related to feeling pressure that they 'ought' to be participating, particularly given their high perceived competence. However, high introjection, alongside high scores for identified and intrinsic regulation, did not appear to be motivationally problematic.

In contrast, the lowly motivated group, although small, reflected much lower physical activity and was generally less self-determined in its motivation. In addition, they were less likely to feel that sport ability was incremental. To support the face validity of our findings, the moderately motivated cluster generally fell in the middle of the two other clusters on measures of physical activity, incremental beliefs, and self-determined motivation.

Overall, the clusters point towards the positive nature of a task orientation which, in turn, was associated with self-determined motivation and a belief that ability is changeable through learning. These findings suggest that if appropriate social and environmental structures are in place (e.g., accessible sports facilities, positive encouragement from teachers and parents), many young people could be motivated towards physical activity.

Results showed that girls were under-represented in the highly motivated cluster. Notwithstanding the lack of gender difference in the lowly motivated group, this suggests that concerns about girls' and young women's interest and participation in physical activity may be justified (Van Mechelen, Twisk, Post, Snel, & Kemper, 2000). Interventions to move more girls into the highly motivated cluster might involve changes to the motivational climate in school physical education (Ames, 1992), aiming to promote a greater autonomy-supportive environment (Ryan & Deci, 2000a), and strategies to enhance the belief that improvement in ability is possible through learning.

Within the limitations of cross-sectional research, we have demonstrated important motivational profiles for young people. Self-reported motivational variables differentiated more from less active youth, and boys were more likely to be highly motivated than girls. However, relatively few boys or girls reported strongly negative responses.

Our research requires replication and refinement using multi-method research. For example, qualitative methods may uncover features of adolescents' lives concerning how physical activity is chosen or not chosen alongside competing activities. Similarly, follow-up analyses, validating clusters with independent samples, as well as qualitative work with young people representative of each cluster, will likely prove fruitful. Finally, responses of parents and teachers could be informative when set alongside the responses of the young people themselves.

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