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Motivation in physical education across the primary-secondary school transition

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Abstract

The purpose of this study was to examine the temporal patterns of approach-avoidance achievement goals, implicit theories of ability and perceived competence in physical education across the transition from primary to secondary school. We also evaluated the predictive utility of implicit theories and perceived competence with regard to achievement goal adoption, and determined the moderating influence of gender on temporal patterns and antecedent-goal relationships. One hundred and forty pupils (mean age at start of study = 11.37 years, SD = .28) completed measures of entity and incremental beliefs, perceived competence and goals on four occasions during a 12-month period. Mastery-approach, performance-approach and performance-avoidance goals, as well as entity and incremental beliefs, exhibited a linear decline over time. Mastery-avoidance goals showed no significant change. Girls exhibited a linear decline in perceived competence, whereas for boys, the trajectory was curvilinear. Competence perceptions predicted initial scores, but not rate of change, on mastery-approach and both types of performance goals. Incremental beliefs predicted rate of change in mastery-approach goal adoption, whereas entity beliefs were associated with changes in performance-avoidance goals and initial scores on performance-approach goals. Limited differences between boys and girls in these antecedent-goal relationships were observed.

- 1 Key words: approach-avoidance achievement goals, implicit theories of ability,
- 2 perceived competence, physical education, primary-secondary school transition
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2

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8

Motivation in Physical Education Across the Primary-Secondary School Transition

The motivation of young people in school physical education (PE) has been a popular topic of research in recent years. Much of this interest has been fuelled by a concern that pupils' experiences of PE may not be positive, an awareness of increasing sedentary behaviours among youth coupled with rising juvenile obesity, and a recognition of the importance of the PE context in reaching all young children and adolescents in laying a foundation for active, healthy lifestyles beyond school (Biddle, Sallis & Cavill, 1998). Researchers have utilised a wide array of theoretical perspectives to further understanding of motivation. One of the most frequently employed frameworks has been achievement goal theory (Elliot, 1999, 2005; Nicholls, 1989). The present study adopted Elliot's contemporary hierarchical model of approach-avoidance achievement motivation in identifying predictors of change in pupils' PE-based goals as they progressed from primary to secondary schooling.

Achievement Goals, Implicit Beliefs, and Perceived Competence

The work by Elliot (see Elliot, 1999, 2005; Elliot & McGregor, 2001) and associates in the educational domain has sought to provide a comprehensive model of achievement motivation through consideration of both approach and avoidance forms of motivation, i.e., the need to achieve competence and the need to avoid incompetence. Elliot's model amalgamates the approach and avoidance components of need achievement theory with the mastery and performance goals of dichotomous goal perspectives theory (see Nicholls, 1989) to propose a 2 x 2 achievement goal framework. The four achievement goals proposed in this framework reflect different representations of the definition and valence of competence. Specifically mastery-approach goals focus on developing task- or self-referent competence, whereas mastery-avoidance goals focus on avoiding developing task- or self-referent

1 incompetence. Thus, pupils may strive to do their best on a class activity in the PE
2 lesson, or alternatively, their striving may stem from a concern that they are unable to
3 do the activity as well as they feel they can. Performance-approach goals focus on
4 demonstrating normative competence and performance-avoidance goals focus
5 on avoiding demonstrating normative incompetence. Thus, pupils aim to show they
6 are one of the best in the class at an activity, or alternatively, they are more concerned
7 with being worse at the activity than their classmates. In his theorising, Elliot
8 identifies a number of potential antecedents which are thought to represent the reasons
9 for individuals adopting these different goals in an achievement situation. These
10 include, for example, implicit theories of ability, competence expectancies, need for
11 achievement, fear of rejection, perception of the motivational climate, fear of failure,
12 and gender (see Elliot, 1999). In PE, the temporal relations between implicit theories
13 of ability and perceptions of competence with the four goals of the approach-
14 avoidance framework have received limited empirical attention. In the present study,
15 therefore, we focussed attention on the predictive utility of these antecedents whilst
16 controlling for possible gender effects.

17 Implicit theories of ability refer to the stability or malleability of human
18 attributes and behaviours. Initially, research extensively examined implicit theories in
19 the educational domain with regard to the effect of children's views about the stability
20 or malleability of their intelligence on educational achievement (see Dweck, 1999).
21 This research has supported the existence of two implicit theories of ability, termed
22 incremental and entity theories. The endorsement of incremental beliefs leads
23 individuals to view personal attributes and behaviours as being malleable, controllable
24 qualities that are increasable through learning. On the other hand, the endorsement of
25 entity beliefs leads individuals to view personal attributes and behaviours as a fixed,

1 stable capacity (quantity) that cannot be improved. As such, individuals are described
2 as incremental theorists or entity theorists depending on which view of human
3 attributes and behaviours they endorse.

4 Research in the educational and physical domains has shown that entity and
5 incremental beliefs are associated with different achievement goals. Holding
6 incremental beliefs leads to the adoption of mastery goals, whereas the endorsement
7 of entity beliefs leads to the adoption of performance goals (Biddle et al., 1999, 2003;
8 Cury et al., 2002; Dweck & Bempechat, 1983; Dweck & Leggett, 1988; Lintunen et
9 al., 1999; Ommundsen, 2001; Sarrazin et al., 1996). Particularly in the PE and sport
10 contexts, however, previous research has adopted mainly cross-sectional designs that
11 limit the strength of conclusions regarding causality and direction of influence.

12 Elliot's model (Elliot, 1999) also suggests that perceptions of competence
13 antecede achievement goal adoption. High perceptions of competence are expected to
14 be associated with approach goals (both mastery and performance), while low
15 perceptions of competence are expected to be associated with both types of avoidance
16 goals. Research in education and PE domains has found support for these links
17 between perceptions of competence and approach-avoidance achievement goals (e.g.,
18 Cury et al., 2002; Elliot & Church, 1997). However, there is a dearth of longitudinal
19 research that speaks to the patterns of change in competence perceptions and
20 approach-avoidance achievement goal adoption over time. Studies of dichotomous
21 achievement goals and perceptions of competence in PE utilising cross-sectional age
22 comparisons have suggested, however, that older pupils report lower task (mastery)
23 orientation and perceived competence than younger pupils (Digelidis & Papaioannou,
24 1999).

25 Primary-Secondary School Transition

One of the key periods in a child's school career that is likely to impact on their experiences, motivation and achievement in all school subjects, including PE, is the transition from primary to secondary school. This transition occurs during a key developmental period for pupils and can be a difficult time, both academically and socially (Zeedyk et al., 2003). In the educational domain, the Observational Research and Classroom Learning Evaluation (ORACLE) project assessed pupils' enjoyment, motivation and achievement across the transfer from primary to secondary school in the UK (see Delamont & Galton, 1986; Galton & Wilcocks, 1983). This research found that as much as forty percent of pupils failed to make the expected progress in the year immediately after transfer in mathematics, reading and language skills. In addition, while pupils' motivation and enjoyment increased in the first term after transfer, they had declined by the end of the school year to levels below those observed in primary school prior to transfer. A recent replication of the ORACLE project found a similar pattern of results (Hargreaves & Galton, 2002).

Research by Eccles and colleagues in the US (Eccles & Harold, 1991; Eccles et al., 1989, 1993a&b; Jacobs et al., 2002; Wigfield et al., 1991) has utilised the expectancy-value theory of achievement motivation (Eccles et al., 1983; Wigfield & Eccles, 1992) to examine the influence of the transition from primary school to secondary school on achievement motivation¹. Of particular interest are the findings on sport competency beliefs. While there appeared to be a general downward trajectory in sport competency beliefs over a child's school career, this decline accelerated following the transition to secondary school (Jacobs et al., 2002). The greatest declines in sport competency beliefs were observed immediately after the transition (Eccles et al., 1989; Marsh, 1989; Wigfield et al., 1991).

Several studies have utilised the dichotomous achievement goal perspective (Dweck, 1986, 1990; Nicholls, 1989) to examine pupils' achievement motivation in mathematics and English across the primary to secondary school transition (e.g., Anderman & Anderman, 1999; Anderman & Midgley, 1997). Pupils reported lower endorsement of mastery goals, greater adoption of performance goals, and a decline in perceived academic competence in both subjects after the transfer.

The Present Study

To our knowledge, there has been no published research that has examined pupil's implicit theories of ability, perceived competence and approach-avoidance goals across the transition from primary to secondary school in the PE context. The aim of the present research was to examine temporal patterns among key achievement motivation variables and to examine the predictive utility of implicit theories of ability and perceived competence to approach-avoidance achievement goal adoption as pupils progressed from Year 6 in primary school to Year 7 in secondary school. Moreover, the effects of gender on goals, goal antecedents, and antecedent-goal relationships were examined.

Previous research has revealed no consistent pattern of gender differences in the endorsement of incremental and entity theories of ability and approach-avoidance goal adoption. Limited evidence suggests that academically able girls are more likely than able boys to endorse an entity theory of ability (Leggett, 1985). However, other evidence suggests there are no gender differences in the endorsement of incremental and entity beliefs (Freedman-Doan et al., 2000). In education, Anderman and colleagues (Anderman & Anderman, 1999; Anderman & Midgley, 1997) have shown that boys are more likely to endorse performance goals than girls. This finding complemented other studies which identified gender differences to exist in the

1 endorsement of achievement goals (Ryan et al., 1997; Roeser et al., 1997). However,
2 a review of research on gender and motivation in the educational domain concluded
3 that there was ‘no clear pattern of gender differences in students’ achievement goal
4 orientations’ (Meece et al., 2006, p. 360).

5 Gender differences in competency beliefs, which emerge early in a child’s
6 school career, have been shown to remain across the transition to secondary school
7 and through late adolescence (Eccles & Harold, 1991; Eccles et al., 1993b; Jacobs et
8 al., 2002, Wigfield et al., 1991). Boys report higher sport competency beliefs than
9 girls. In PE-based studies in the UK, girls have been found to be over-represented in
10 clusters that can be described as ‘poorly motivated’ i.e., characterised by weak goal
11 orientations, incremental beliefs, and perceived competence, or ‘amotivated’ i.e.,
12 characterised by low mastery orientation, incremental beliefs, perceived competence
13 and high entity beliefs. On the other hand, boys tend to be over-represented in ‘highly
14 motivated’ groups i.e., characterised by strong goal orientations, incremental and
15 entity beliefs, and perceived competence (see, for example, Wang & Biddle, 2001).

16 Based on previous research, we anticipated that pupils would, on average,
17 decline in their perceptions of competence in PE across the transition to secondary
18 school (Jacobs et al., 2002). Perceptions of competence were predicted to be higher
19 for boys than girls at all assessment points (Jacobs et al., 2002; Wang & Biddle,
20 2001). Further, we hypothesised that higher perceptions of competence would predict
21 initial status (when pupils were in Year 6) and rate of change (throughout Year 7) in
22 mastery-approach and performance-approach goals. On the other hand, lower
23 competence perceptions would be associated with initial status and rate of change in
24 mastery-avoidance and performance-avoidance goals. Moreover, we expected
25 incremental beliefs to predict initial status and rate of change in mastery-approach and

1 mastery-avoidance goals, whereas entity beliefs were hypothesised to predict initial
 2 status and rate of change in both types of performance goals (Cury et al., 2002; Elliot,
 3 1999, 2005). Finally, due to the present research being the first, to our knowledge, to
 4 assess implicit theories of ability and approach-avoidance achievement goals in PE
 5 across the transfer to secondary school, we decided not to propose specific a priori
 6 hypotheses for their temporal patterns. Similarly, given that previous research has not
 7 revealed consistent differences between boys and girls in the adoption of implicit
 8 theories and achievement goals, we chose not to posit hypotheses for this aspect of the
 9 study.

10 Method

11 Participants

12 Male ($n=68$) and Female ($n=72$) participants from Year 6 of three primary
 13 schools in East England, United Kingdom participated in the research. These schools
 14 were selected on the basis that they were feeder schools to a specific secondary school
 15 where arrangements for post transfer data collection had already been agreed. At the
 16 start of the research (wave 1), participants were aged 10 or 11 years ($M = 11.37$, $SD =$
 17 0.28 years).

18 Procedures

19 Ethical approval for the research procedures was obtained from the relevant
 20 institutional body. These procedures complied with the guidelines of the British
 21 Psychological Society. Permission for conducting the research was sought from the
 22 head teacher at each of the primary schools and the secondary school to which
 23 participants were transferring at the end of the school year. Parental consent was
 24 obtained through distribution of letters prior to data collection. Following an
 25 introduction to the purpose of the research, informed assent was given from all

participants through the completion of a willingness to participate form. Any child who did not have parental consent or give their informed assent for participation in the research was withdrawn from all data collection procedures. All procedures took place in a normal curriculum lesson. Participants were assured that all information collected would be anonymous and would remain confidential. They were provided with the opportunity to ask any questions before the questionnaire was administered. An explanation of how to complete each section of the questionnaire was given. Each participant responded to an anonymous multi-section questionnaire which took approximately 20 minutes to complete. These procedures were repeated at 3, 6 and 12 months following wave 1. At wave 1, the participants were nearing the end of Year 6 of primary school and at waves 2 – 4, participants had transferred into Year 7 of secondary school.

Measures

Each participant completed a multi-section questionnaire that collected the following information.

Personal Details. This section of the questionnaire contained items relating to form group, date of birth, gender, age, and primary school. Because the questionnaires were anonymous and repeated measurements were to be taken, this information allowed participants to be identified at subsequent data points.

Goal Adoption. Goal adoption was assessed using the Achievement Goals Questionnaire for Sport (Conroy et al., 2003). Students responded to 12 items on a seven-point Likert scale that ranged from not at all true of me (1) to very much like me (7). Three items assessed each type of goal. Sample items included, ‘It is important for me to perform as well as I possibly can’ (mastery-approach), ‘I am often concerned that I may not perform as well as I can perform’ (mastery-avoidance), ‘It is

1 important to me to do well compared to others' (performance-approach), 'I just want
2 to avoid performing worse than others' (performance-avoidance).

3 *Implicit Theories of Ability.* Participants' conceptions of the nature of ability in sport
4 and PE were assessed using the 'Conceptions of the Nature of Athletic Ability
5 Questionnaire version 2' (CNAAQ-2, Biddle et al, 2003). Twelve items, assessing
6 four sub-scales which reflect different representations of the nature of ability, were
7 answered on a five-point Likert scale that ranged from strongly disagree (1) to
8 strongly agree (5). Sample items include 'It is difficult to change how good you are at
9 sport/PE' (stable), 'To be good at sport/PE you need to be naturally gifted' (gift),
10 'You need to learn and to work hard to be good at sport/PE' (learning), 'If you put
11 enough effort into it, you will always get better at sport/PE' (improvement). The
12 CNAAQ-2 posits a hierarchical factor structure, with stable and gift sub-scales
13 underpinning a higher order entity belief, and learning and improvement sub-scales
14 underpinning a higher order incremental belief. In the present study, we were
15 interested only in the two higher-order dimensions of implicit beliefs.

16 *Perceived Competence.* Pupils' sense of competence in PE was assessed using six
17 items answered on a 5-point Likert scale that ranged from strongly disagree (1) to
18 strongly agree (5). Example items included 'I am often able to successfully complete
19 the activities I am set in PE', 'I can perform tasks and skills in PE better than I used
20 to', and 'I am better at PE than others in my class'.

21 Data Analysis

22 First, we examined the extent and pattern of missing data across the four
23 intervals, and determined whether associations were evident between missing data and
24 the substantive variables under investigation. Data were missing as a consequence of
25 normal absences on the days of questionnaire administration. There were no

1 significant associations between number of missed measurement occasions and initial
2 scores on implicit beliefs, perceived competence or goals. Because the amount of
3 missing data was small, we chose not to replace missing scores.

4 All main analyses were carried out using MLwiN (version 2.0, Rasbash et al.,
5 2005).² MLwiN is specifically designed to analyse multilevel data (see Singer &
6 Willett, 2003). In the present study, repeated measurement occasions were nested
7 within individuals. Moreover, implicit beliefs and perceptions of competence served
8 as time-varying predictors of achievement goal adoption (to explain within- and
9 between-person variability), whereas gender acted as a time-invariant predictor (to
10 explain between-person variance only). A series of models was examined to address
11 the current research questions. In these models, time was centred at wave 1 and the
12 time-varying predictors were grand-mean centred (Singer & Willett, 2003). Model A
13 represented an unconditional means model which was used to assess the amount of
14 between-person and within-person variance in the variables under investigation. The
15 variance estimates produced from this model allow the intra-class correlation
16 coefficient to be calculated. The intra-class correlation coefficient indicates how
17 much of the total variation in the dependent variable is attributable to differences
18 between individuals and provides the justification for using multilevel methods of
19 data analysis. In the present research, the intraclass correlation coefficients were as
20 follows: perceived competence (0.61), incremental beliefs (0.42), entity beliefs (0.36)
21 and mastery-approach (0.57), mastery-avoidance (0.28), performance-approach (0.52)
22 and performance-avoidance goals (0.47). These coefficients suggested that significant
23 amounts of variance remained that could potentially be explained by within- and
24 between-person predictors.

1 Model Bi represented an unconditional growth model which examined the
2 initial status and linear rate of change for each of the variables under investigation.
3 Model Bii represented a nonlinear growth model which examined whether there were
4 quadratic changes over time in the variables under investigation. Both linear and
5 quadratic representations of time were included in this model.³

6 Model C represented an uncontrolled effects model. These models separately
7 examined whether gender, incremental beliefs, entity beliefs or perceived competence
8 predicted either initial status or rate of change in students' approach-avoidance
9 achievement goal adoption. In line with theoretical propositions, perceived
10 competence and incremental beliefs were entered as predictors of initial status and
11 rate of change in mastery- approach and avoidance goals. Similarly, perceived
12 competence and entity beliefs were entered as predictors of initial status and rate of
13 change in performance- approach and avoidance goals (Dweck, 1986, 1999; Elliot,
14 1999). In addition, an uncontrolled effects model examined the effect of gender on
15 the initial status and rate of change in incremental and entity beliefs and perceptions
16 of competence.

17 The final model (Model D) represented a controlled effects model. These
18 models examined the effects of implicit theories of ability or perceived competence
19 on pupil's initial status and rates of change in approach-avoidance achievement goal
20 adoption while controlling for the effects of pupils' gender.

21 Model fit was assessed through examination of the deviance statistic of the
22 model ($-2 \log L$) and established whether adding predictors of initial status and the
23 rate of change significantly improved model fit.⁴ In order to present the most
24 parsimonious models, only those main effects and interaction effects for models in

which a significant improvement in model fit was observed are reported (Cohen, Cohen, West & Aiken, 2003).

Results

Preliminary Analyses

Descriptive statistics and internal consistency estimates were computed for each subscale at each wave of measurement and are presented in Table 1 along with the average internal consistency estimates across time. Mean scores for all subscales except for mastery-avoidance and perceived competence showed a decline over the course of the investigation. At wave 1, the observed alpha values for three subscales (mastery-approach, performance-avoidance and incremental beliefs) were below 0.70. At wave 2, only the mastery-approach scale failed to exhibit acceptable levels of internal consistency, whereas all subscales showed acceptable reliability at waves 3 and 4. The average alpha values for each subscale across waves of measurement exceeded 0.70.

INSERT TABLE 1 ABOUT HERE

Main Analyses

Temporal patterns. Results from the unconditional growth model (Model Bi) showed that the mean level (intercept) of each variable under investigation was significantly different from zero at the first wave of measurement. Of the four achievement goals, mastery-approach goals (5.50) had the highest intercept and mastery-avoidance goals (4.33) the lowest intercept at wave 1. Incremental beliefs (4.15) were more highly endorsed than entity beliefs (2.62). Examination of the rate of change (slope) of all variables revealed that mastery-approach ($\beta = -0.08$, $p <$

.001), performance-approach ($\beta = -0.21, p < .001$) and performance-avoidance goals ($\beta = -0.24, p < .001$), incremental beliefs ($\beta = -0.05, p < .05$) and entity beliefs ($\beta = -0.07, p < .01$) evidenced significant change over time. Specifically, these variables showed a linear decline in scores across waves 1 to 4. Perceived competence exhibited a nonlinear rate of change over time, which was indicated by a significant improvement in model fit when a quadratic term was added to the model ($\Delta X^2(4) = 13.23, p < .05$) (Model Bii). A small decline in perceived competence was observed immediately after transfer to secondary school, followed by a plateau during the remainder of Year 7. Finally, mastery-avoidance goals showed no significant change over time ($\beta = 0.01, p > .05$).

Gender differences in goals, perceptions of competence and ability beliefs. At wave 1, gender (coded 0 = female, 1 = male) was a positive predictor of mastery-approach ($\beta = 0.85, p < .001$), performance-approach ($\beta = 0.94, p < .001$) and performance-avoidance goals ($\beta = 0.46, p < .05$) and perceived competence ($\beta = 0.67, p < .001$). Boys reported higher scores on these variables than girls at wave 1 and at all subsequent measurement occasions. The interaction between gender and quadratic time ($\beta = 0.09, p < .05$) was a significant predictor of perceived competence. As illustrated in Figure 1, perceived competence was predicted to show a linear decline over time for girls, while for boys the trajectory revealed a small decrease on transfer to secondary school with a slower decline during Year 7 and a small increase at the end of the school year. No other main effects, nor interaction effects between gender and time, were observed ($p > .05$).

 INSERT FIGURE 1 ABOUT HERE

Predicting change in mastery-approach goal adoption. In Model C, perceptions of competence ($\beta = 0.87, p < .001$) were found to positively predict mastery-approach goal adoption at the start of the research, but had no effect on the rate of change over time ($p > .05$). In contrast, incremental beliefs had no effect on the adoption of mastery-approach goals in Year 6 ($p > .05$), but positively predicted the rate of change in mastery-approach goal adoption across Year 7 ($\beta = 0.20, p < .001$).

We then repeated the analyses but controlling for pupils' gender (Model D). Results are presented in Table 2. For a one-point difference in perceived competence, average initial mastery-approach goal adoption was 0.89 higher; for a one-point difference in incremental beliefs, average rate of change in mastery-approach goal adoption during Year 7 was 0.20 higher.

INSERT TABLE 2 ABOUT HERE

Predicting mastery-avoidance goal adoption in Year 6. In Model C, perceptions of competence and incremental beliefs had no significant effect on mastery-avoidance goal adoption at the end of Year 6 ($p > .05$). However, as shown in Table 3, when controlling for gender (Model D), perceptions of competence positively predicted mastery-avoidance goal adoption. For a one-point difference in perceived competence, average initial mastery-avoidance goal adoption was 0.36 higher. Controlling for perceived competence, boys reported lower scores on mastery-avoidance goals than girls when at primary school.

INSERT TABLE 3 ABOUT HERE

1

2 *Predicting change in performance-approach goal adoption.* The addition of
3 either perceptions of competence or entity beliefs to the model predicting
4 performance-approach goals (Model C) revealed that both perceived competence ($\beta =$
5 0.80, $p < .001$) and entity beliefs ($\beta = 0.24$, $p < .05$) predicted performance-approach
6 goal adoption in Year 6. However, they had no effect on the rate of change across
7 Year 7 ($p > .05$). When controlling for gender (Model D), for a one-point difference in
8 perceived competence, average initial performance-approach goal adoption was 0.77
9 higher; for a one-point difference in entity beliefs, average rate of change in
10 performance-approach goal adoption during Year 7 was 0.33 higher (see Table 4).

11

INSERT TABLE 4 ABOUT HERE

13

14 *Predicting change in performance-avoidance goal adoption.* In Model C,
15 perceptions of competence ($\beta = 0.51$, $p < .001$) were found to predict performance-
16 avoidance goal adoption at the start of the research, but had no effect on the rate of
17 change ($p > .05$). In contrast, entity beliefs had no significant effect on the adoption
18 of performance-avoidance goals in Year 6 ($p > .05$), but positively predicted the rate
19 of change in performance-avoidance goal adoption across Year 7 ($\beta = 0.13$, $p < .05$).
20 When controlling for gender (Model D), for a one-point difference in perceived
21 competence, average initial performance-avoidance goal adoption was 0.61 higher;
22 for a one-point difference in entity beliefs, average rate of change in performance-
23 avoidance goal adoption during Year 7 was 0.13 higher (see Table 5).

24

INSERT TABLE 5 ABOUT HERE

25

Discussion

Physical education provides a unique setting in the school curriculum for examining achievement motivation. The focus on physical competence as well as cognitive competence sets it apart from many other subjects in the school curriculum. The striving for competence or striving to avoid incompetence is pertinent in PE as the abilities of pupils are unambiguous, constantly on public display and can be easily and regularly evaluated by the self and others. The present research sought to identify temporal patterns among key achievement motivation variables in PE across the transfer from primary to secondary school. The predictive utility of implicit theories of ability and perceived competence in explaining approach-avoidance achievement goal adoption over this transitional education period were examined. Finally, we sought to determine the influence of gender on these motivational processes.

Temporal Patterns of Achievement Goals, Beliefs and Perceived Competence

All achievement goals as conceptualised by the 2 x 2 framework (Elliot, 1999, 2005; Elliot & McGregor, 2001) were endorsed in the present sample as mean scores at each measurement occasion were above the scale mid-point. However, consistent with previous research in the physical domain, mastery-approach goals were the most strongly endorsed on all four occasions (Conroy & Elliot, 2004; Conroy et al., 2003; Wang, Biddle & Elliot, 2007).

The present research provides the first insight into the temporal patterning of approach-avoidance achievement goal adoption in the PE context from primary to secondary school. Following the transfer to secondary school, there was a linear decline in the adoption of mastery-approach, performance-approach and performance-avoidance goals during Year 7. The analysis also revealed that the adoption of

1 mastery-avoidance goals was stable over the study period. In PE, young children's
2 concern with, and their striving to avoid, self- and task-referenced failure appears to
3 be persistent, at least during the period studied in the current investigation. This may
4 be of concern to teachers of PE as it shows a focus of their students on incompetence
5 and failure. The salience of mastery-avoidance goals in PE across the primary-
6 secondary transition supports previous cross-sectional research on adolescents in the
7 physical domain (Conroy et al., 2003; Wang, et al., 2007). Initial studies suggest that
8 young people may experience motivational difficulties as a result of pursuing
9 mastery-avoidance goals (e.g., Conroy et al., 2006).

10 In the present study, a decline in both types of performance goals was
11 observed over the transition from primary to secondary school. This contrasts with
12 evidence in the educational domain which examined dichotomous achievement goals
13 over a transition (Anderman & Anderman, 1999; Anderman & Midgley, 1997).
14 Further research which examines pupils' motivation in Year 8 of secondary school
15 and beyond is needed to establish whether this decline is temporary. Moreover, this
16 research should identify the situational predictors of pupils' approach-avoidance
17 performance goal adoption, which were unexplored in the present study.

18 At all four measurement occasions, individuals in the current sample held the
19 view that sport ability can be improved and developed through learning more strongly
20 than the view that sport ability is a fixed, stable quantity. This finding is consistent
21 with previous research in the physical domain (Biddle et al., 2003; Cury et al., 2002).
22 The temporal analysis of implicit theories of ability revealed a linear decline in the
23 endorsement of incremental and entity beliefs across the primary-secondary transition.
24 Future work needs to identify, not only the causal predictors of such changes, but also
25 their motivational ramifications for young people in PE.

Mean scores for perceptions of competence in the present sample were above the scale mid-point at all four measurement occasions, although highest when pupils were at primary school. A nonlinear trajectory emerged for perceptions of competence across the primary-secondary school transition for the total sample. Perceptions of competence showed a decline when transferring to secondary school, and continued to decline at a slower rate in the early part of Year 7 before reaching a plateau at the end of the year. When pupils transfer to secondary school, they become members of a new and larger reference group, in which they make judgements about their ability relative to others. The addition of new members to this reference group alters the standard for being one of the best at PE, which may make pupils feel less able than when based in primary school classes. The transfer to secondary school also results in the pupils being taught by specialist PE teachers, rather than generalist primary teachers. The PE teachers may promote new criteria or standards by which individuals judge their competence. Pupils may feel less able to meet the new standards immediately after transfer and so feel less competent than when participating in PE at primary school. Pupils may also be introduced to a variety of new activities which they are less confident of mastering. These situational characteristics may serve to reduce perceptions of competence at the start of secondary school.

However, as pupils progress through Year 7, they complete additional units of work which build on the tasks and skills learnt at the beginning of the year, and so may feel more able to meet the demands of PE. Pupils have also established themselves within their new, larger reference groups and adjusted to the standards of competence promoted by PE teachers. These aspects may halt the decline in perceptions of competence throughout Year 7.

Predicting Approach-Avoidance Achievement Goals

Consistent with theoretical predictions, individuals who endorsed the view that ability in PE is a fixed, stable quantity were more likely, initially, to adopt goals focused on normative competence (Dweck, 1986, 1999). In addition, over time, higher entity beliefs were positively associated with performance-avoidance goal adoption. Interventions that serve to minimise the development of entity beliefs among pupils in PE may counteract potential concern with demonstrating normative incompetence during Year 7. Consequently, pupils will be less likely to experience the negative outcomes linked with this form of achievement striving, i.e., low levels of performance and intrinsic motivation, high levels of anxiety and worry (Elliot & Church, 1997; Elliot & Conroy, 2005; Elliot & McGregor, 2001).

Incremental beliefs were shown to predict increases in mastery-approach goals over the course of the study. In other words, endorsing the view that ability can be improved and developed through learning led to an increased adoption, over time, of goals which focused on developing task- and/or self-referenced competence. In accordance with previous research in which mastery-approach goals were associated with the most positive outcomes in achievement situations (e.g., persistence, effort, intrinsic motivation, self-regulated learning; Elliot & Church, 1997; Elliot & McGregor, 2001; Middleton & Midgley, 1997), the present work adds further support to the importance of developing and sustaining in pupils a belief that physical skills can be acquired and improved through learning and practice.

In line with theoretical propositions and previous research in the physical domain, perceptions of competence were positively associated with both types of approach goals (Cury et al., 2002; Wang et al., 2007). However, counter to theoretical propositions (Elliot, 1999, 2005), performance-avoidance goals were

1 positively related with perceptions of competence. Previous research in the PE
2 context has also found this relationship to be positive (Wang et al., 2007). The ability
3 of young children to discern between the subtleties of performance-approach and
4 performance-avoidance achievement striving may account for this finding (see Urdan
5 & Mestas, 2006). Further research, adopting both quantitative and qualitative
6 approaches, is needed to ascertain children's and adolescents' comprehension of these
7 constructs in PE.

8 Although perceived competence was positively linked with mastery-approach,
9 performance-approach and performance-avoidance goals on all measurement
10 occasions, there was no effect on changes in goal adoption. It would appear that
11 changes in perceived competence have little impact on the dynamics of achievement
12 goal striving among pupils starting secondary school. Based on present results,
13 interventions in the physical domain that wish to increase pupils' adoption of mastery-
14 approach goals may be more effective if they target other antecedents e.g.,
15 incremental ability beliefs.

16 The Influence of Gender

17 In the present study, uncontrolled effects models revealed that gender was not
18 associated with variability in incremental and entity beliefs about ability, either in
19 primary school, or during the first year of secondary school. However, gender
20 differences in perceived competence, along with mastery-approach, performance-
21 approach and performance-avoidance goal adoption, appeared to be established by the
22 time pupils left primary school, and these differences remained during Year 7. This
23 suggests that future research designed to capture changes in children's sense of
24 competence and goal adoption in PE (and associated predictors) should be conducted
25 during the primary school years. We need to ascertain the individual and

1 environmental characteristics that lead boys to feel more competent in primary school
2 PE class and report greater striving to demonstrate self- and normatively-referenced
3 competence (and avoid normatively-referenced incompetence).

4 In line with previous literature in the physical domain, boys reported higher
5 perceptions of competence than girls at all measurement occasions (Eccles, Wigfield,
6 Harold & Blumenfeld, 1993; Marsh, 1998). The trajectory for boys evidenced a small
7 decline over the transfer to secondary school, a slower decline in the early part of
8 Year 7, and a small increase at the end of Year 7. This is encouraging as boys'
9 perceptions of competence appeared to recover over the course of Year 7 from the
10 decline observed immediately after transfer to secondary school. For girls, it would
11 seem that perceptions of competence exhibit a linear decline. Further work is
12 necessary to determine if the decline in girls' perceived competence continues through
13 Year 8.

14 The significant findings relating antecedents to goals in uncontrolled effects
15 models remained when controlling for gender e.g., the effects of perceived
16 competence on adoption of both types of approach goals in Year 6 and the effects of
17 entity beliefs on the rate of change over time in performance-avoidance goals.
18 However, some interesting insights emerged. For example, when controlling for
19 perceived competence, gender appeared to be associated with mastery-avoidance
20 goals (in favour of girls). Controlling for gender, perceived competence positively
21 predicted initial mastery-avoidance goal adoption. Moreover, although initial
22 performance-avoidance goal adoption was predicted by perceived competence,
23 change in performance-avoidance goal scores over the course of the study was
24 explained by gender. Controlling for perceived competence, boys were estimated to
25 report greater performance-avoidance goal adoption over time than girls.

1 In conclusion, the present research highlights some important changes in
2 motivation in PE classes as children transition from primary to secondary school.
3 These changes appear, on the whole, to be suggestive of less adaptive motivation
4 profiles e.g., reduced competence perceptions, lowered incremental views about
5 ability, and lowered mastery-approach goal adoption. However, we also found a
6 reduction in performance-avoidance goal striving over time, which could arguably be
7 interpreted as adaptive. Longer-term longitudinal research, involving multiple
8 primary and secondary schools, is required to enhance the generalisability of results,
9 and in particular, to investigate important environmental predictors of achievement
10 motivation at the teacher, class and school levels. The focus of the current study was
11 restricted to the influence of personal antecedents impacting on goal pursuit. Future
12 studies should determine the combined influence of implicit ability beliefs and
13 competence perceptions. Work is also needed to identify the cognitive, affective and
14 behavioural outcomes linked to changing motivational processes. We would
15 especially recommend that research efforts are pursued to delineate the temporal
16 patterning of pupils' motivational perceptions and outcomes in PE over their entire
17 school careers. Present findings suggest, for example, that the effects of perceived
18 competence on goal pursuit may occur earlier in pupils' schooling than the effects of
19 implicit ability beliefs. Unlike perceived competence, the influence of incremental
20 views of ability on mastery-approach goals, and entity views on performance-
21 avoidance goals, appeared to emerge during the first year of secondary school rather
22 than during primary school. These empirical findings require verification in larger
23 samples, but ultimately may inform the timing of targeted interventions. Such
24 endeavours will collectively assist primary teachers and specialist physical educators
25 to optimise motivation in PE across the transition from primary to secondary school.

Notes

¹ In the present paper, the phrase ‘primary to secondary school’ will be used throughout, even when referring to research based in the United States on the transfer from elementary to junior high school.

² Confirmatory factor analyses were also conducted at each time point on the scales measuring achievement goals, beliefs, and perceived competence but results are not reported here. The findings supported previous research in the physical domain which has found the AGQ-S and CNAAQ-2 to be valid and reliable measures of approach-avoidance achievement goals and implicit theories of ability respectively (Biddle et al., 2003; Conroy et al., 2003). Given that we specifically designed perceived competence items for the present study, we conducted CFA to establish reliability and factorial validity of the perceived competence scale. Results supported a one factor model (e.g., Time 1: $\chi^2 = 1.97$ (6df), NNFI = 1.073, CFI = 1.000, SRMR = .017, RMSEA = .000 (CI = .000 - .037). Factor loadings across all time points ranged from .514 - .847. Further details can be obtained from the first author.

³ Only perceived competence exhibited nonlinear change over time. Model C for perceived competence therefore developed from the unconditional nonlinear growth model. Model C for all other variables developed from the unconditional linear growth model.

⁴ Details of the deviancy statistics pertaining to model modifications can be obtained from the first author.

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Table 1: Descriptive Statistics and Internal Consistency Estimates at Each Wave of Measurement

	Range	Wave 1			Wave 2			Wave 3			Wave 4			Average α Waves 1-4
		M	SD	α	M	SD	α	M	SD	α	M	SD	α	
Mastery-Approach	1-7	5.51	1.25	.67	5.46	1.20	.63	5.33	1.29	.75	5.31	1.34	.74	.70
Mastery-Avoidance	1-7	4.34	1.71	.78	4.34	1.63	.78	4.29	1.53	.75	4.39	1.48	.80	.78
Performance-Approach	1-7	4.59	1.71	.83	4.27	1.73	.88	4.06	1.63	.89	3.98	1.69	.88	.87
Performance-Avoidance	1-7	5.06	1.53	.62	4.72	1.62	.80	4.57	1.55	.77	4.35	1.71	.83	.76
Perceived Competence	1-5	4.01	0.74	.81	3.68	0.85	.85	3.78	0.83	.85	3.64	0.90	.89	.85
Incremental Beliefs	1-5	4.18	0.65	.68	4.05	0.71	.72	4.03	0.71	.76	4.03	0.71	.78	.74
Entity Beliefs	1-5	2.61	0.85	.71	2.57	0.89	.75	2.49	0.86	.77	2.40	0.75	.71	.74

Table 2: Controlled Effects Models Predicting Mastery-Approach Goal Adoption

Fixed Effects		Perceived Competence		Incremental Beliefs		
		Estimate	SE		Estimate	SE
Initial status	Intercept	5.240	0.076***	Intercept	5.076	0.124***
	PC	0.892	0.061***	Incremental ^a	0.169	0.102
	Gender	0.351	0.106**	Gender	0.807	0.177***
Rate of change				Intercept	0.002	0.043
				Incremental	0.198	0.062***
				Gender	-0.147	0.047**

Note: *Intercept* describes the coefficient for initial status and rate of change in MAp goals for a girl of average perceived competence/incremental beliefs. *PC/Incremental* describes the coefficient for the differential in initial status or rate of change for a one-unit difference in perceived competence/incremental beliefs controlling for the effect of gender. *Gender* describes the coefficient for the differential in initial status and rate of change between girls and boys controlling for the effect of perceived competence/incremental beliefs.

^a In this model, the main effect of incremental beliefs was retained even though it was non-significant because when it was removed there was a significant decline in model fit.

** $p < 0.01$ *** $p < 0.001$

Table 3: Controlled Effects Models Predicting Mastery-Avoidance Goal Adoption

Fixed Effects		Perceived Competence	
		Estimate	SE
Initial status	Intercept	4.542	0.116***
	PC	0.355	0.093***
	Gender	-0.349	0.167*

Note: *Intercept* describes the coefficient for initial status in MAV goals for a girl of average perceived competence. *PC* describes the coefficient for the differential in initial status for a one-unit difference in perceived competence controlling for the effect of gender. *Gender* describes the coefficient for the differential in initial status between girls and boys controlling for the effect of perceived competence.

* $p < 0.05$ *** $p < 0.001$

Table 4: Controlled Effects Models Predicting Performance-Approach Goal Adoption

Fixed Effects		Perceived Competence		Entity Beliefs		
		Estimate	SE	Estimate	SE	
Initial status	Intercept	4.110	0.149***	Intercept	4.047	0.164***
	PC	0.767	0.091***	Entity	0.331	0.087***
	Gender	0.595	0.195**	Gender	0.951	0.211***
Rate of change	Intercept	-0.131	0.047**	Intercept	-0.192	0.049***

Note: *Intercept* describes the coefficient for initial status and rate of change in PAp goals for a girl of average perceived competence/entity beliefs. *PC/Entity* describes the coefficient for the differential in initial status for a one-unit difference in perceived competence/entity beliefs controlling for the effect of gender. *Gender* describes the coefficient for the differential in initial status between girls and boys controlling for the effect of perceived competence/entity beliefs.

** $p < 0.01$ *** $p < 0.001$

Table 5: Controlled Effects Models Predicting Performance-Avoidance Goal Adoption

Fixed Effects		Perceived Competence		Entity Beliefs		
		Estimate	SE		Estimate	SE
Initial status	Intercept	4.913	0.115***	Intercept	4.698	0.149***
	PC	0.614	0.087***	Entity ^a	0.121	0.115
				Gender	0.626	0.197**
Rate of change	Intercept	-0.270	0.056***	Intercept	-0.216	0.046***
				Entity	0.129	0.059*
	Gender	0.208	0.073**			

Note: *Intercept* describes the coefficient for initial status and rate of change in PAV goals for a girl of average perceived competence/entity beliefs. *PC/Entity* describes the coefficient for the differential in initial status and rate of change for a one-unit difference in perceived competence/entity beliefs controlling for the effect of gender. *Gender* describes the coefficient for the differential in initial status and rate of change between girls and boys controlling for the effect of perceived competence/entity beliefs.

^a In this model the main effect of entity beliefs was retained even though it was non-significant because when it was removed there was a significant decline in model fit.

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Figure Captions

Figure 1: Temporal pattern of perceived competence in physical education among boys and girls across the primary-secondary school transition.