

# EUROPEAN PHYSICAL EDUCATION REVIEW

## The Effect of Perceived Psychological Need Support on Amotivation in Physical Education

Journal:	<i>European Physical Education Review</i>
Manuscript ID:	EPE-14-0061.R2
Manuscript Type:	Original Manuscript
Keywords:	amotivation, perceived psychological need support, Physical Education, Secondary
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THE EFFECT OF PERCEIVED NEED SUPPORT ON AMOTIVATION

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2 AMOTIVATION

8 The Effect of Perceived Psychological Need Support on Amotivation in Physical  
9 Education

Resubmission Date: May 20th 2015

22 Submitted to: European PE Review

## THE EFFECT OF PERCEIVED NEED SUPPORT ON AMOTIVATION

**Abstract**

Physical educators have a responsibility to create a learning environment that is viewed as supportive of students' psychological needs and which helps reduce amotivation. The aim of the current study was to examine the effects of students' perceived need support on four dimensions of amotivation in Physical Education (PE) (*deficiency in ability beliefs, deficiency in effort beliefs, insufficient task values and unappealing task characteristics*). A longitudinal design was employed with three assessment points over a six-week unit of work in cricket. Surveys were conducted with 162 boys (Mean age = 14 years,  $SD = 0.87$ ) over three consecutive PE lessons in weeks one, three and five. At the start of the study, multilevel modelling analyses showed all three types of perceived need support negatively predicted *unappealing task characteristics* and *insufficient task values*. Over time, perceived *autonomy, competence and relatedness support* negatively predicted change in *unappealing task characteristics* but did not significantly predict change in *deficiency in ability beliefs, deficiency in effort beliefs* and *insufficient task values*. Overall, the findings suggest that if students perceive their teacher to provide inadequate support for their basic psychological needs, PE tasks become less appealing over time, thus reinforcing the importance of teachers in ameliorating the development of specific amotivated behaviours in PE.

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Keywords: amotivation, perceived **psychological** need support, physical

education.

For Peer Review

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1 psychological needs of autonomy, competence and relatedness. In the PE context,  
2 research has started to show that teaching behaviours that do not support the basic needs  
3 and/or thwart these needs are related to amotivation and subsequent maladaptive student  
4 outcomes (Ntoumanis et al; 2004; Shen et al; 2010b; Standage et al; 2005). According  
5 to Deci and Ryan (2002), amotivation is a psychological state whereby an individual is  
6 unable to identify an association between their behaviour and the outcome of their  
7 behaviour, and amotivation is therefore an absence of motivation. Amotivated  
8 individuals in PE tend to perceive the lesson to be of low importance, are unhappy with  
9 the teaching style, and display behaviours such as forgetting PE kit and low attendance  
10 (Ntoumanis et al; 2004). Given that educational research has shown a decline in  
11 physical activity among adolescents (Malina and Katzmarzyk, 2006), it is important to  
12 explore socio-contextual factors such as types of teachers' need support that may be  
13 temporal antecedents of amotivation. For example, SDT literature has highlighted three  
14 adaptive factors of the social environment (such as teachers' interpersonal style) that  
15 may influence individuals' psychological needs (Reeve, Deci and Ryan, 2004). These  
16 are autonomy support, structure and interpersonal involvement. Autonomy support  
17 refers to behaviours from those in a position of authority (e.g. teachers) that allows  
18 students provision of choice and freedom of expression. In addition, students' views are  
19 acknowledged, and minimal pressure is ensued (Deci et al; 1994). Structure refers to  
20 whether teachers provide clear instructions, set clear objectives and challenging goals,  
21 and are consistent and predictable (Skinner and Edge, 2002). Finally, interpersonal  
22 involvement refers to the willingness of teachers to provide empathy, affection, time  
23 and energy to the students they interact with (Deci and Ryan, 1991; Reeve et al; 2004).  
24 Work by Tessier and colleagues (2010) have identified the importance of the  
25 aforementioned teacher behaviours by finding an increase in students' need satisfaction

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self-determination and engagement in PE.

**Amotivation**

Understanding the sources of students' lack of motivation is imperative to the promotion of life long engagement and participation in physical activity. According to self-determination theory, individuals may be motivated to participate in sport and exercise activities for intrinsic and/or extrinsic reasons (Ryan and Deci, 2009). People who are intrinsically motivated represent the highest form of self-determination and are fully self-regulated having internalised the behaviour, engage in activities out of interest and volition, and do not need external influences to encourage persistence (Deci and Ryan, 1985, 2000). In contrast, extrinsic motivation refers to behaviours that are determined by factors outside of the activity itself. SDT identifies four types of extrinsic motivation, which are differentiated by the degree to which motives have become internalised (Ryan and Deci, 2000). Internalisation stems from a mini-theory of SDT, termed organismic integration theory (OIT; Deci and Ryan, 1985), and describes how people accept or 'take in' the value of tasks to guide their behaviour. Amotivation represents an absence of motivation and is evident when individuals lack the intention and willingness to engage in a particular behaviour. Amotivation is a complete lack of self-determination and may result if the individual lacks competence, devalues the activity or is deficient in their abilities to achieve a desired outcome (Ryan and Deci, 2000). As amotivation lies on a continuum, the regulation of behaviour can become more internalised if social environments and key social agents (such as the teacher) support the internalisation process (Deci and Ryan, 2008).

Although the literature on motivation within PE is increasing, there remain limited studies that have explored amotivation explicitly in the PE context. PE is a compulsory subject, and therefore one is more likely to identify amotivated individuals

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in PE as opposed to extra-curricular activities. Amotivated behaviours may be

demonstrated in various ways, for example, failing to turn up to lessons with full PE kit,

opting to sit out of activities, playing sedentary roles, displaying a lack of effort, and

failing to learn new material (Ntoumanis et al; 2004; Sun and Cheng, 2008).

Recognising the importance of amotivation in the education context, Green-

Demers and colleagues, (2008) conceptualised and empirically validated amotivation as

a multi-dimensional construct consisting of four dimensions; *deficiency in ability*

*beliefs, deficiency in effort beliefs, insufficient task values and unappealing task*

*characteristics*. Studies in PE have supported the factorial validity of multidimensional

measures of amotivation (Shen et al; 2010a; Vlachopoulos et al; 2013).

*Deficient ability beliefs* describe students who believe they do not have the

ability to do well, and are therefore most vulnerable to being detached from school

(Eccles et al; 1993). *Deficient effort beliefs* are adopted when an individual fails to

expend the sustained effort asked of them to perform and maintain the behaviour. In a

PE setting, students may be reluctant to get involved in game situations or activities,

and opt to play more stationary roles that require less physical effort. Furthermore,

Ryan and Deci (2000) included lack of value as part of the definition of amotivation and

subsequently *insufficient task values* comprises one of the four amotivation dimensions.

Therefore, if an individual devalues PE they may uphold negative attitudes towards the

subject and consequently experience motivational deficits (Wigfield and Eccles, 2000).

Finally, *unappealing task characteristics* are related to feelings of boredom, which have

been linked to amotivation in past research (Ainley et al; 2002; Legault et al; 2006;

Ntoumanis, 2001; Ntoumanis et al; 2004). Tasks that are deemed as too challenging for

students can also induce boredom (Standage et al; 2005). Students are more likely to be

enthusiastic if they deem an activity interesting (Hidi and Harackiewicz, 2000), and



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1 therefore it is imperative that teachers create a stimulating environment for their

2 students to capture their interest.

### 3 **Need support**

4       The social environment strongly influences motivation behaviours by supplying  
5 “fundamental nutrients” referred to as basic psychological needs; *autonomy* (a sense  
6 of volitional control), *competence* (effectively interacting with the environment to yield  
7 desired outcomes) and *relatedness* (feeling connected with significant others) (Deci and  
8 Ryan, 2000). Basic psychological needs theory (BPNT), another **subtheory** of SDT,  
9 suggests that when these basic needs are supported in our social environment,  
10 individuals’ need satisfaction increases which then promotes a sense of self-  
11 determination. Thus, teachers have a pivotal role in enhancing more autonomous forms  
12 of motivation in PE.

13       *Autonomy support from teachers* should intend to foster ‘volitional intentions to  
14 act’ so students feel they are in control over their choices and actions (Reeve and Jang,  
15 2006) Teachers may provide students with a range of different ways to solve a problem  
16 or complete a task so the student feels they are self directing their behaviour, and as a  
17 result increase their levels of self-determined motivation (Ward et al; 2008). In PE for  
18 example, teachers would be showing autonomy support by finding ways to increase  
19 students’ values towards specific activities, tactics and concepts, **via for example**  
20 **providing meaningful rationale for activities and particular tasks**. In so doing, students  
21 will gain a sense of meaning and control over their actions (Reeve and Jang, 2006).

22 **Research needs to explore whether** low perceived autonomy support may be closely  
23 associated with *insufficient task values* and consequently help foster amotivated  
24 behaviours. *Competence support* from teachers may involve positive feedback and  
25 encouragement during and after the lesson, **setting differentiated tasks, allowing**

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1 sufficient practice time, and helping students to focus on the process of learning a skill

2 rather than the outcome (Alderman et al; 2006). Low competence may be linked to

3 *deficiency in ability beliefs* and, therefore, one would expect students to experience

4 higher levels of amotivation if the teacher does not support this need. Lastly *relatedness*

5 *support from teachers and classmates* has been highlighted in the literature as being an

6 important need that is crucial among students at school (Koka and Hagger, 2010;

7 Perlman, 2010; Vallerand, 2001). Providing opportunities for students to feel connected

8 with their peers and teachers is essential, and the PE context is an environment whereby

9 students have the opportunity to develop positive relationships with others. If teachers

10 demonstrate willingness to care for their students, provide empathy and support for their

11 feelings towards different activities, and interact with students, then this will help

12 students' motivational development (Shen et al; 2010b; Standage et al; 2006).

13 Empirical work in students' perception of *psychological* need support and

14 amotivation has been demonstrated by Shen and colleagues (2010b). Shen and co-

15 workers conducted a study investigating the influence of inadequate teacher-to-student

16 social support on amotivation among high-school physical education students in the

17 United States. They particularly looked at the different dimensions of amotivation to see

18 whether the perceptions of need support from the teacher influenced the amotivation

19 subtypes. They found that teacher *relatedness support* was negatively associated with

20 *insufficient task values* and *unappealing task characteristics*; teachers' *autonomy*

21 *support* was not associated with any of the four amotivation dimensions, and

22 *competence support* strongly predicted all four types of amotivation. However, one

23 limitation of their study was the cross-sectional design, which consequently confines the

24 researchers to only explore correlates of amotivation at one time point. To date, most

25 studies in PE have examined amotivation as a uni-dimensional construct using cross-

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sectional designs. A more comprehensive understanding of amotivation in PE using a longitudinal perspective is needed to attempt to understand the ways in which students' perceptions of teacher need support may affect students' amotivation whilst students gain more experience working with their teacher. One may assume that with effective teaching, students' perception of **psychological** need support will increase, together with students' self-determined motivation. However, this may not be the case, and some students may perceive their teacher to be unsupportive of their needs and subsequently could have a maladaptive effect on students' behaviour.

The current study, therefore, aimed to shed light on whether low perceptions of **psychological** need support predicts the development of amotivation over time. **Yet recent amotivation research has shown the importance of controlling for confounding influences. Jackson-Kersey and Spray (2013) for example,** highlighted the negative relationship between *deficient ability beliefs* and physical self-concept (PSC). **PSC being defined as an individuals' perception of his or her appearance, body fat, coordination and other aspects of the physical self (Marsh et al; 1994)** The present investigation **therefore** controlled for PSC in determining the effects of teacher need support on the amotivation subtypes across a six-week unit of work in PE. A unit of work is a planned sequence of lessons over a short time period (5-6 weeks) that is focused on one activity, and details progression and learning outcomes throughout the unit. Due to limited research on the amotivation dimensions and inadequate teacher **psychological need** support, caution was observed in proposing specific hypotheses. However, in line with theoretical predictions it was anticipated that *perceived autonomy, competence and relatedness* support would **be negatively associated with** the four amotivation dimensions over time.

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**Method****2 Participants**

Participants were recruited from an all boys' grammar school in southeast England of which 162 boys (mean age = 14 years, SD = 0.87) from Year 9 took part in the study. The majority of students were of middle socio-economic status. Year 9 was chosen for our sample as physical activity in boys during adolescence is declining and the older age group has been marked as the most problematic (HSE, 2012). Participants took part in a minimum of one hour of physical activity per week in the form of a games lesson, and one hour of PE per week on a fortnightly rotation. It was decided that data collection took place in a PE lesson as opposed to a games lesson as PE provides a more structured environment whereby students remain in the same class every lesson and are taught by the same teacher. In addition, all teachers were required to teach a unit of work in the chosen activity (cricket) to ensure all students in all classes were taught the required skills and tactics. Six PE classes of approximately 30 boys in each class took part in the study. All participants were taught a programme of work on cricket which consisted of six lessons over 6 weeks. Two male teachers taught these classes at different times during the week, and individual classes were consistently taught by the same teacher throughout the unit of work. All students had been taught by their class teacher for eight months prior to data collection, and some students would have been taught by the class teacher in previous school years and in extra-curricular activities.

**21 Measures**

***Amotivation in Physical Education:*** To assess students' amotivation in cricket, the Amotivation Inventory in Physical Education (AI-PE) (Shen, 2010a) was adapted. The AI-PE consists of 16 items measuring the four dimensions of amotivation: *Deficient ability beliefs* (e.g. 'I don't have what it takes to do well in cricket'; *Deficient*

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1 *effort beliefs* (e.g. ‘I’m not energetic enough’); *Unappealing characteristics of the task*  
2 (e.g. ‘My cricket lessons are not stimulating’); and *Insufficient task values* (e.g. ‘Cricket  
3 is not valuable to me’). Students were firstly instructed to state on a Likert-scale (1 =  
4 Never to 7 = Always) ‘how often do you feel a lack of motivation to do cricket’. They  
5 were then asked to rate on a Likert-scale from 1-7 (1 = does not correspond at all to 7 =  
6 corresponds exactly) each statement that corresponded with their reasons for not  
7 wanting to do PE. Mean scores were then calculated at each time point. Evidence for the  
8 reliability and validity of the AI-PE has been supported by Shen et al. (2010a).

9 ***Student perceptions of teacher need support:*** Students’ perceptions of  
10 *autonomy support* were measured using a PE modified version of the Learning Climate  
11 Questionnaire (LCQ) adapted by Standage et al, (2005). In the present study, four items  
12 were extracted from the 15-item LCQ to measure *autonomy need support*. To measure  
13 *competence need support* and *relatedness need support*, four items for each variable  
14 were adapted from the questionnaire devised by Standage and colleagues (2005).  
15 Students were asked to rate on a Likert scale (1 = Not at all true: 7 = Very true) how  
16 true each statement was in relation to the PE class they had just participated in and the  
17 PE teacher who taught them. Each item was preceded by the stem, “In this PE class...”  
18 There were 12 items overall measuring support for three needs; *autonomy support* (e.g.  
19 ‘I feel the PE teacher provided us with choices and options’); *competence support* (e.g.  
20 ‘I feel the PE teacher helped me to improve’) and *relatedness support* (e.g. ‘The PE  
21 teacher supported us’). Mean scores were then calculated at each time point. Evidence  
22 for the reliability and validity of the LCQ and the competence and relatedness support  
23 items were supported by Standage et al. (2005).

**Procedures**

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1 After obtaining institutional ethical approval, permission to conduct the study  
2 was first obtained from the head teacher, followed by parental consent. Letters were  
3 sent to parents explaining the aims of the study and their right to reply if consent was  
4 not granted. No parent chose this option. All participants completed an informed assent  
5 form at the start of the study, detailing the class that they were in and their date of birth.  
6 Participants were informed that they had the right to withdraw at any time and all  
7 responses would remain anonymous. They were told that there were no right or wrong  
8 answers and to answer honestly. All participants were given a multi-section  
9 questionnaire at the end of their PE lessons, which took approximately fifteen minutes  
10 to complete. Questionnaires were administered in week 1, 3 and 5 during the 6-week  
11 unit of cricket in the summer term to measure students' responses at the beginning,  
12 middle and end of the unit. Students were asked for their date of birth at the start of  
13 completing every questionnaire so responses could be matched over the three time  
14 points.

**Data analytic strategy**

16 Descriptive statistics and internal reliability coefficients (Cronbach's alpha)  
17 were first calculated for all study variables across all measurement waves. **Given we**  
18 **adapted the AI-PE in the present study to relate to cricket, it felt prudent to check the**  
19 **factor structure. This was done through confirmatory factor analysis (CFA).** To explore  
20 the relationships between the amotivation scores and the other variables, correlations  
21 were assessed at each time point among the amotivation dimensions, perceptions of  
22 teacher need support, and PSC. Next, unconditional means models were examined to  
23 ascertain the intraclass correlations of all study variables i.e. to determine the proportion  
24 of variance explained at different levels. Subsequently, unconditional growth models  
25 were tested to identify average patterns of change across the study for each variable.

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1           The main study analyses addressed whether **changes in the** four amotivation  
2 dimensions could be predicted by **change in** perceptions of teachers' need support  
3 whilst controlling for PSC. Multilevel regression analyses employing MLwiN 2.23  
4 (Rashbash et al; 2009) were used to examine change in student amotivation. This type  
5 of analysis is useful when there are missing observations since it does not assume an  
6 equal number of measurement occasions for all individuals (Hox, 2002). Level 1  
7 analysis encompassed the repeated observations of amotivation sub-types, PSC, and  
8 students' perceptions of teacher need support nested within students (level 2). Time was  
9 centered at wave one, intercepts were allowed to vary randomly across levels and all  
10 predictor variables were grand-mean centered. For each dependent variable, the model  
11 tested the fixed effects of perceptions of teacher need support and PSC at the start of the  
12 study (initial status) and over time. Additional analyses explored whether results  
13 differed when not controlling for PSC. Due to finding no substantial change in the  
14 results for each analysis, PSC was subsequently removed from the final multilevel  
15 models.

## Results

### Preliminary analyses

18           **Factor analysis.** Confirmatory factor analysis (CFA) was employed using EQS  
19 (version 6.1; Bentler, 2003) to determine the factor structure of the scale used to  
20 measure amotivation. Recent research has found the AI-PE to consist of four correlated  
21 factors (Jackson-Kersey and Spray, 2013), representing the four amotivation  
22 dimensions. Examination of the fit indices indicated that the data adequately fit the four-  
23 factor model (CFI = .95, NNFI = .94, SRMSR = .05, RMSEA = .06). Bentler (2003)  
24 proposed that good fit of a hypothesised model to the data is indicated when the CFI is  
25  $\geq .95$ , the SRMR is  $\leq .08$ , and the RMSEA is  $\leq .06$ .



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1           **Descriptives.** The means, standard deviations and **internal reliabilities** for all  
2 variables were calculated for each of the three time points (see Table 1). The mean  
3 scores for amotivation were below the midpoint suggesting a low amotivated sample  
4 and the mean scores for perceived support for autonomy, competence and relatedness  
5 were all above the midpoint, suggesting the sample on average felt their needs were  
6 being supported by the teacher. All scales were above alpha = 0.82 **indicating good**  
7 **internal consistency.** Correlations were assessed among all variables at each time point  
8 and correlations from the first assessment point are shown in Table 2. These analyses  
9 revealed that teacher *autonomy, competence and relatedness support* was significantly  
10 inversely correlated with *deficiency in ability beliefs, insufficient task values* and  
11 *unappealing task characteristics* but no significant correlations were found with  
12 *deficient effort beliefs.*

13           **Unconditional means models.** Unconditional means models were calculated for  
14 each variable to determine the intraclass correlation (ICC) for each variable at the  
15 student level. An unconditional means model has no predictors at either level and  
16 identifies whether there is systematic variation in the **variable** worth exploring, as well  
17 as whether the variation lies within- or between-individuals (Singer and Willett, 2003).  
18 There was sufficient between-person variation in the intercepts (ICCs ranged from .48  
19 to .65). Within-person variation in the intercepts ranged from .35 to .52 **across the three**  
20 **time points.**

21           **Unconditional growth models.** Unconditional growth models, with time serving  
22 as the only predictor, showed, on average, non-significant changes in all four  
23 amotivation dimensions over the three time points. However, students' perceptions of  
24 *autonomy support* ( $\beta = 0.17$ ) showed a significant increase over time, whereas



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1 *competence* ( $\beta = -0.30$ ) and *relatedness support* ( $\beta = -0.28$ ) demonstrated a significant  
2 decrease.

3 **Main analyses**

4 ***Predicting change in amotivation across the unit of work.*** Conditional growth  
5 models (see Table 3) were constructed exploring potential changes in the intercept and  
6 slope (i.e. rate of change) of the amotivation dimensions and perceptions of need  
7 support. A series of models were estimated with students' perceptions of *autonomy*,  
8 *competence and relatedness support* predicting within-and between-person change in  
9 the four amotivation dimensions. At the start of the study, teacher support for all three  
10 needs negatively predicted *insufficient task values* (*autonomy* NS ( $\beta = .15$ ,  $SE = .06$ ),  
11 *competence* NS ( $\beta = .17$ ,  $SE = .06$ ), *relatedness* NS ( $\beta = .15$ ,  $SE = .06$ ) and *unappealing*  
12 *task characteristics* (*autonomy* NS ( $\beta = .17$ ,  $SE = .06$ ), *competence* NS ( $\beta = .19$ ,  $SE =$   
13  $.06$ ), *relatedness* NS ( $\beta = .16$ ,  $SE = .06$ ). *Competence support* negatively predicted  
14 *deficiency in ability beliefs* ( $\beta = .10$ ,  $SE = .05$ ). *Deficiency in effort beliefs* was not  
15 predicted by any of the three types of support ( $p > .05$ ). Over time, however **changes in**  
16 perceived teacher support for all three needs negatively predicted changes in  
17 *unappealing task characteristics* (*autonomy* NS ( $\beta = .08$ ,  $SE = .04$ ), *competence* NS ( $\beta =$   
18  $.09$ ,  $SE = .04$ ), *relatedness* NS ( $\beta = .09$ ,  $SE = .04$ )) but did not predict change in  
19 *deficiency in ability beliefs*, *deficiency in effort beliefs* and *insufficient task values* ( $p >$   
20  $.05$ ).

22 **Discussion**

23 The purpose of this study was to examine whether change in the four  
24 amotivation dimensions was related to change in students' perceptions of their teacher's  
25 psychological need support during a six-week unit of cricket. There is evidence to

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1 indicate that amotivation in PE can lead to maladaptive behaviours **such as forgetting**

2 **PE kit, claiming to be medically unfit and being absent from school** (Ntoumanis et al;

3 2004; Shen et al; 2010a) and that need supportive environments can enhance self-

4 determination (Standage et al; 2005; Standage et al; 2006). However, limited attention

5 has been paid to exploring teacher effects on separate amotivation dimensions over

6 time.

**Amotivation and need support**

8 In the current study, perceived teacher support for all three needs negatively

9 predicted *insufficient task values* and *unappealing task characteristics* and only

10 competence need support predicted *deficiency in ability beliefs* at the beginning of the

11 unit of work. Therefore after the first PE lesson (Time 1), students who felt their teacher

12 had provided inadequate support for their autonomy, competence and relatedness

13 valued the cricket lesson less and may have evoked feelings of boredom and disinterest.

14 Furthermore, *competence need support* emerged to be the strongest predictor of

15 *unappealing task characteristics* as well as being the only perceived source of support

16 to negatively predict *deficiency in ability beliefs*. Supporting students' competence has

17 been stated in the literature as being crucial in forestalling amotivated behaviours (Deci

18 and Ryan, 2002) and aiding the internalisation process, leading to an increase in

19 intrinsic motivation (Ryan and Deci, 2000). Given that teachers are the primary agents

20 to support ability among students and enhance their self-regulation, training needs to be

21 put in place to provide teachers with knowledge as to how to deliver instructions,

22 provide feedback and subsequently foster the student-teacher relationship.

23 The findings at Time 1 were partially supported by research from Shen and

24 colleagues (2010b) who also revealed that perceived teachers' *competence* and

25 *relatedness support* negatively correlated with *unappealing task characteristics*.

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1 Additionally, Vlachopoulos et al, (2013) examined the validity of the AI-PE by  
2 exploring the associations of the amotivation variables with self-determination variables  
3 such as needs for autonomy, competence and relatedness. **These authors found that**  
4 *competence need support* negatively predicted *deficient ability beliefs* but together with  
5 *relatedness need support*, did not predict *unappealing task characteristics or*  
6 *insufficient task values*. Inconsistent findings across studies **reinforce** that researchers  
7 need to further explore relationships between low perceived need support and  
8 amotivation.

9       The findings at Time 1 did not correspond exactly with the results that emerged  
10 over time. Perceived teacher need support in all three needs negatively predicted change  
11 in students' *unappealing task characteristics* over the unit of work but did not predict  
12 change in other amotivation dimensions. The results indicate that a six-week unit of  
13 work may have been too short to see significant changes between the beginning and end  
14 of the study. Nevertheless, if a student feels the teacher is not supporting their need to  
15 have control over the decisions they make (low autonomy), not enabling them to  
16 confidently interact in the PE setting (low competence), and perhaps unintentionally  
17 creating environments whereby they do not feel accepted by their peers (low  
18 relatedness), then students are more likely to find the task boring and lose interest. The  
19 practical implications for the teacher as a result of these findings are that students may  
20 become disengaged from the lesson and may be 'turned off' cricket in the future. An  
21 important pedagogical understanding for PE teachers is that one student may be  
22 amotivated in one activity due to lack of interest (Hidi and Harackiewicz, 2000) but  
23 have self-determined motivation in another due to its appeal. The PE curriculum offers  
24 diverse physical activities to cater for students' personal interests and, therefore, it can  
25 be a challenging environment for teachers to foster high quality motivation in all

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1 students (Sun and Cheng, 2008). Not all activities are intrinsically interesting for  
2 everyone. Some students, for example, may not enjoy running, but because it is a  
3 worthwhile activity for improving cardiovascular fitness, teachers need to help motivate  
4 students by educating them on the importance and value of the task. Future research  
5 would do well to explore changes in amotivation dimensions across different activities  
6 to help teachers provide additional need support in activities that are less appealing and  
7 less valued among students.

8         Disconfirming our hypothesis, **changes in** perceptions of *autonomy, competence*  
9 *and relatedness support* did not significantly predict changes in *deficiency in ability*  
10 *beliefs, deficiency in effort beliefs* or *insufficient task values*. In other words, even if a  
11 student perceived their teacher to support their needs, no significant change would  
12 occur in the aforementioned amotivation subtypes. Again, an explanation may lie in the  
13 six-week unit of work being too short, therefore not allowing enough time for change to  
14 occur. It may take time for some students to develop relationships with their teacher and  
15 subsequently students may have found it difficult to report accurate perceptions of  
16 teacher need support in a limited time frame. Moreover, it may take longer to observe  
17 change in a students' *deficiency in ability* and *effort beliefs* as these amotivation  
18 dimensions are focused on students' feelings towards themselves. Such personal  
19 preconceptions may be more difficult than task-related perceptions for students to  
20 modify without enduring support and attention from the teacher. Positive feedback to  
21 enhance feelings of competence and encouragement from the teacher are a necessity.  
22 The teacher is required to know and understand their students' individual needs in order  
23 to improve their learning in PE.

**Limitations and future research**

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1           There are several limitations to be considered in evaluating the current findings.  
2           First, no causal inferences could be made in relation to the associations between  
3           perceived need support and amotivation. However, the findings are supported by  
4           previous empirical evidence to suggest the importance of need support for change in  
5           amotivated behaviours (Shen et al; 2010b; Vlachopolous et al; 2013). Second, this study  
6           did not measure students' need satisfaction plus other variables that might have had an  
7           influence on amotivation, e.g. past experiences. According to SDT, social-contextual  
8           factors such as perceptions of need support should have an indirect influence on  
9           motivational regulations via the satisfaction of the three basic psychological needs (Cox  
10           and Williams, 2008; Deci and Ryan, 2000; Vallerand, 2001). Future studies should,  
11           therefore, recognise need satisfaction as an important mediator between the  
12           environment and the amotivation subtypes.

13           Moreover, recent research has begun to explore Deci and Ryan's (2000)  
14           contention that psychological need thwarting will lead to ill-being and maladaptive  
15           outcomes. Not all previous literature has found low need support and low need  
16           satisfaction to relate to maladaptive outcomes, perhaps due to not explicitly assessing  
17           the 'darker side of teaching' (Bartholomew et al; 2011). Thus, perceptions of teacher  
18           need thwarting may be a stronger indicator of amotivated behaviours among students.  
19           Future research should investigate students' perceptions of need thwarting by the  
20           teacher, inadequate need support, and their subsequent effects on the four amotivation  
21           dimensions.

22           The present findings were also based on a relatively small adolescent male  
23           sample, so are unable to be generalised to female adolescents. Evidence suggests that  
24           female adolescents are more likely to be amotivated than boys (Sallis et al; 2000; Wang  
25           et al; 2002) and, therefore, studies exploring the gender differences in amotivation in a

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1 PE context would be welcomed and beneficial for physical educators. Furthermore, due  
2 to the present study being longitudinal, attrition was evident. The sample size decreased  
3 from 162 participants at the start of the study to 130 participants at the end. This decline  
4 can be explained by students being absent from school or the PE lesson, non-  
5 participation due to illness or injury, or not completing the questionnaire sufficiently to  
6 obtain recordable responses. It could be argued that these specific students might  
7 display amotivated behaviours towards PE and as a consequence, the present study may  
8 include a biased sample. Overcoming this predicament is challenging for researchers, as  
9 highly amotivated students are likely to be those individuals who do not participate in  
10 the PE lesson. However, although students' mean amotivation scores were low,  
11 (suggesting self-determined motivation was present), this study identifies teachers as  
12 being a potential influence on changing students' levels of amotivation scores over  
13 time. Teacher behaviours that have been identified in the literature to support the three  
14 basic needs are structure, interpersonal involvement and autonomy support. Findings  
15 have suggested that teacher training in how to effectively provide these three behaviours  
16 in lessons has resulted in a decrease in student amotivation (Tessier et al; 2010). Further  
17 research is needed to be able to guide teachers on how to successfully support students'  
18 **psychological** needs. Likewise, more longitudinal studies are needed to observe change  
19 in amotivation over a longer period of time in the PE context **controlling for**  
20 **confounding variables. Although PSC was not found to be a significant predictor of**  
21 **amotivation in the current study, future research nevertheless should identify key**  
22 **moderating influences.**

23 In conclusion, current findings highlight the importance of teachers to create an  
24 environment that supports the **basic psychological** needs and forestalls the development  
25 of amotivation among some students. As indicated by the results, teachers who

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1 inadequately support students' autonomy, competence and relatedness in PE may evoke  
2 feelings of boredom, and disinterest in the PE lesson. Over time, students subsequently  
3 may display avoidance behaviours such as opting for more sedentary roles in the lesson,  
4 **purposely** forgetting their PE kit, and poor attendance (Ntoumanis et al; 2004). It is  
5 imperative, therefore, that teachers are **encouraged to seek and employ** strategies to  
6 modify their behaviours and create need supportive environments. Future studies would  
7 do well to examine predictors of change in amotivation over a longer time period and  
8 across a number of different activities involving boys and girls. Larger scale  
9 investigations could also yield data revealing the class-level, as well as individual-level  
10 influences on amotivation among adolescents. **As a result a more comprehensive**  
11 **understanding of motivational processes in PE will be achieved.**

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For Peer Review

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Table 1. Means, Standard Deviations, and Reliability Coefficients for all Variables Across the Three Time Points

Variable	Time 1 (n = 162)			Time 2 (n = 141)			Time 3 (n = 130)		
	<i>M</i>	<i>SD</i>	$\alpha$	<i>M</i>	<i>SD</i>	$\alpha$	<i>M</i>	<i>SD</i>	$\alpha$
Deficiency in AB	2.16	1.25	0.85	2.21	1.30	0.82	2.26	1.31	0.91
Deficiency in EB	2.27	1.44	0.92	2.33	1.47	0.92	2.26	1.29	0.90
Insufficient TV	2.30	1.61	0.91	2.33	1.71	0.96	2.45	1.58	0.94
Unappealing TC	2.46	1.45	0.85	2.59	1.62	0.92	2.59	1.60	0.93
Autonomy NS	3.61	1.60	0.85	3.73	1.87	0.91	3.96	1.80	0.90
Competence NS	4.86	1.55	0.85	4.36	1.78	0.89	4.32	1.80	0.92
Relatedness NS	4.85	1.48	0.86	4.37	1.76	0.90	4.29	1.82	0.94
PSC	4.51	1.25	0.96	4.54	1.34	0.96	4.50	1.39	0.97

Note: AB = Ability beliefs; EB = Effort beliefs; TV = Task Value; TC = Task Characteristics; PSC = Physical Self-Concept; NS = Need Support

## THE EFFECT OF PERCEIVED NEED SUPPORT ON AMOTIVATION

Table 2. Correlations Among the Amotivation Dimensions, Perceptions of Teacher Psychological Need Support and Physical Self-Concept at Time 1

Variable	1	2	3	4	5	6	7	8
1. Deficiency in AB	—							
2. Deficiency in EB	.64**	—						
3. Insufficient TV	.75**	.59**	—					
4. Unappealing TC	.67**	.56**	.79**	—				
5. Autonomy NS	-.26**	-.14	-.31**	-.40**	—			
6. Competence NS	-.29**	-.14	-.37**	-.43**	.79**	—		
7. Relatedness NS	-.24**	-.11	-.31**	-.36**	.81**	.92**	—	
8. PSC	-.44**	-.31**	-.16**	-.22**	.25**	.23**	.22**	—

Note: AB = Ability beliefs; EB = Effort beliefs; TV = Task Value; TC = Task Characteristics; PSC = Physical Self-Concept; NS = Need Support

\*\* $p < .01$

THE EFFECT OF PERCEIVED NEED SUPPORT ON AMOTIVATION

Table 3. Final Models of Students' Perceptions of Teacher Psychological Need Support Predicting Amotivation Dimensions

Predictors	Deficiency in AB		Deficiency in EB		Insufficient TV		Unappealing TC	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
<i>Initial status</i>								
Intercept	2.17	(.09)*	2.30	(.11)*	2.31	(.12)*	2.50	(.12)*
Autonomy NS	-.06	(.05)	-.04	(.06)	-.15	(.06)*	-.17	(.06)*
Competence NS	-.10	(.05)*	-.05	(.05)	-.17	(.06)*	-.19	(.05)*
Relatedness NS	-.08	(.05)	-.05	(.06)	-.15	(.06)*	-.16	(.06)*
<i>Rate of change</i>								
Intercept	.04	(.05)	-.01	(.06)	.05	(.06)	.05	(.06)
Autonomy NS	-.02	(.03)	-.06	(.04)	-.04	(.04)	-.08	(.04)*
Competence NS	-.01	(.03)	-.06	(.04)	-.04	(.04)	-.09	(.04)*
Relatedness NS	-.02	(.03)	-.04	(.04)	-.04	(.04)	-.09	(.04)*
<i>Variance</i>								
Student ( <i>u</i> )	.96	(.14)*	1.05	(.16)*	1.73	(.23)*	1.52	(.21)*
Residual ( <i>e</i> )	.65	(.06)*	.92	(.08)*	.91	(.08)*	.90	(.08)*

Note: AB = Ability beliefs; EB = Effort beliefs; TV = Task Value; TC = Task Characteristics; NS = Need Support  
 $\beta$  = Beta; SE = Standard Error  
 \* $p < .01$