



Original research

Perceived physical competence towards physical activity, and motivation and enjoyment in physical education as longitudinal predictors of adolescents' self-reported physical activity



Jaakkola Timo^{a,*}, Yli-Piipari Sami^b, Watt Anthony^c, Liukkonen Jarmo^a

^a University of Jyväskylä, Department of Sport Sciences, Finland

^b College of Education, Health and Human Sciences, Department of Health and Sport Sciences, USA

^c College of Education, Victoria University, Australia

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ABSTRACT

Objectives: The aim of the study was to investigate if adolescents' perceived physical competence towards physical activity (PA), and autonomous motivation and enjoyment in physical education (PE) during early adolescence can predict amount and intensity of self-reported physical activity six years later.

Design: This study utilized a 6-year longitudinal data set collected within Finnish school settings. Students responded to questionnaires measuring their perceived physical competence towards physical activity, and autonomous motivation and enjoyment in PE during their first year at middle school (Grade 7), and their PA engagement during their last year in high school (Grade 12).

Methods: A sample of 333 students (200 girls, 133 boys; M age = 12.41, years, SD = .27) participated in the study. Perceived physical competence in physical activity was assessed by the sport competence dimension of the Physical Self-Perception Profile, autonomous motivation in PE was assessed by the Sport Motivation Scale and enjoyment in PE by the Sport Enjoyment Scale. Students' self-reported metabolic equivalent (MET) and PA intensity (light [LPA], moderate [MPA], vigorous [VPA]) was calculated from the short form of International Physical Activity Questionnaire.

Results: Perceived physical competence towards physical activity significantly predicted total METs ($\beta = .28$), MPA ($\beta = .18$) and VPA ($\beta = .29$) six years later. Autonomous motivation and enjoyment in PE at Grade 7, however, were not significant predictors of later PA.

Conclusions: The results of this study support the proposition that self-perception of an individual's abilities arising from interactions with the environment related to PA during early puberty has an influential effect on later PA behaviour.

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1. Introduction

The health benefits from the optimal amount and intensity of physical activity (PA) are considerable for school-aged children.¹ The current recommendations on health-enhancing PA focus on sufficient amount and intensity of PA, suggesting that children and adolescents should participate in at least 60 min per day of moderate or vigorous intensity PA (MPA or VPA). Habitual PA is commonly conceptualized as “any bodily movement that results in energy expenditure”.² This study operationalized and measured PA based on amount as indicated in metabolic equivalents (METs), and

different intensity levels, that are light (LPA), moderate (MPA), and vigorous (VPA) intensities.

Adolescence is an important period when individuals may adopt a physically active lifestyle.³ Adolescents engage in PA experiences within different contexts such as school physical education, sport clubs, and being active with their families and peers. All these encounters shape their own self-competency perceptions within activities related to PA. In fact, systematic reviews have surmised that positive perceived physical competence towards PA is one of the most important correlates of PA during adolescence.^{4,5} A widely applied description of perceived competence is an assessment of personal ability that generalizes across domains, such as physical activity, scholarship, or work.⁶ In this study, perceived competence is explained as the perception of individual's abilities cumulating from interactions within different PA environments.⁷

* Corresponding author.

E-mail address: timo.jaakkola@jyu.fi (J. Timo).

School physical education (PE) is an important context promoting positive PA experiences among youth because it involves access to a large adolescent cohort.⁸ Evidence-based PE programs in early adolescence can provide students with positive motivational and affective experiences, which will promote their later engagement in PA.⁹ In an effort to investigate this association, this study also examined the role of autonomous motivation and enjoyment in PE in predicting later PA engagement.

The underpinning description of PE motivation in the current research utilized the Goal Content Theory (GCT) which is a microtheory of the self-determination theory.¹⁰ According to the GCT, motivation exists on a continuum ranging from amotivation through four types of extrinsic motivation (external regulation, introjected regulation, identified regulation and integrated regulation) to intrinsic motivation.¹⁰ Descriptions of each regulation are given in Table 1. The essential premise of the GCT is that the autonomy of an individual increases towards the intrinsic motivation end of the continuum.¹⁰ Autonomy is detailed as a quality of human functioning that involves the experience of choice and perception of internal perceived locus of causality.¹⁰ Research has indicated that autonomous motivation (intrinsic motivation, integrated and identified regulation) in PE is positively linked with adolescents' PA engagement in PE,¹¹ PA participation during leisure-time,^{12,13} and in total PA participation.¹⁴ In contrast, results reported in these studies revealed that non-autonomous motivation (amotivation, external and introjected regulation) was negatively or not significantly associated with these consequences.

Enjoyment can also be seen as an important positive motive for PA behaviour.^{15,16} Enjoyment is defined as a multidimensional construct incorporating excitement, affect, and perceptions of competence. More specifically, it is defined as a positive affect related to feelings of pleasure, liking and fun.¹⁷ Previous studies have demonstrated that enjoyment in PE is linked with PA engagement in PE^{15,16} and leisure time^{5,16} within adolescent populations.

Overall, this study is framed on previous empirical findings that indicated perceived competence in PA, and PE motivation and enjoyment are significant antecedents of PA participation during adolescence.^{4,11,15} It should be acknowledged that for this study perceived competence reflects the general perception of ability in PA (i.e., PA contexts including PE) whereas motivation and enjoyment specifically denote cognitive and affective perceptions within the PE context. In this study, competence was measured at the domain specific level (general competence towards PA) because domain specific competence is affected by many specific contextual competencies. For example, domain specific competence in PA in

general is affected by specific competencies in areas such as sport and PE. Harter⁷ and Fox⁶ suggested that a person's self-worth is built upon hierarchical structure of competencies in which specific competencies cumulate on more general competence. For example, different specific competencies in different PA areas contribute to general PA competence. Enjoyment and autonomous motivation, instead, are constructs which are considered to be context specific and it is recommended these are also measured and analysed in relation to the context representative of the research focus.¹⁸

Although students' perceived physical competence regarding PA and motivational and affective experiences in PE are acknowledged as important correlates of PA,^{4,11,15} a notable shortcoming of previous research is that there are no studies investigating if these variables predict self-reported PA over the adolescent stage of human development. Previous longitudinal research in the area has previously assessed similar PA related characteristics in middle school students, across intervals of two to three years.^{13,14} As an extension to these investigations, the aim of the current study was to examine if perceived physical competence towards PA, and autonomous motivation and enjoyment in PE measured at Grade 7 would predict (a) total amount of PA (total METs) and (b) the amount of different PA intensities (LPA, MPA, VPA) of self-reported PA six years later. Sex was controlled in the analyses as confounding variable. We hypothesize that perceived physical competence towards PA and autonomous motivation and enjoyment in PE would positively predict higher amount and intensity (MPA, VPA) type of PA engagement.^{4,12,16}

2. Methods

This study utilized the 6-year longitudinal data collected from schools located in central Finland. Whereas the previously published study of Jaakkola et al.¹⁹ reported the findings related to young adolescents' fundamental movement skills and physical fitness and their later PA, the findings presented here are focusing on the examination of relationships between students' motivational experiences in PE during their first year of middle school and their PA engagement six years later. A convenience sample of 333 Grade seven students (200 girls, 133 boys; *M* age = 12.41, years, *SD* = .27) was selected based on their middle school affiliation. A cohort of 224 participants (67%; 149 girls, 75 boys) of the initial group responded to questionnaires 6 years later. The Ethics Committee (Institutional Review Board) of the local university along with students and their parents/guardians approved the study.

The short form of the Finnish version of the International Physical Activity Questionnaire (IPAQ)²⁰ was utilized to examine students' PA. IPAQ asked participants to report frequency and duration of their LPA, MPA, and VPA performed in bouts greater than 10 min in length. Weekly minutes of LPA, MPA, and VPA were calculated separately by multiplying the number of days/week by the duration on an average day. Reported minutes per week in each category were weighted by a MET resulting in a PA estimate independent of body weight, expressed in MET-minutes/week and computed by multiplying METs by minutes/week. The short form of IPAQ has shown acceptable reliability and validity within large scale research that investigated the measurement properties of the instrument in 12 countries.²¹

Perceived physical competence towards PA was measured by the Finnish version of the sport competence dimension of the Physical Self-Perception Profile.²² Each of the five items were rated on a five-point Osgood scale from (1) "I'm among the best when it comes to athletic ability" to (5) "I'm not among the best when it comes to athletic ability". The individual item stem of the scale was "What am I like?" Results presented by Gråsten²³ indicated that the Finnish version of the sport competence dimension of the Physical

Table 1
Definitions of motivational regulations.

| Motivational regulation | Definition |
|-------------------------|---|
| Intrinsic motivation | Pleasure and satisfaction resulting from participation regulate behaviour |
| Integrated regulation | Behavioural regulation when a person has integrated and accepted behaviour with other aspects of the self (coherence with other aspects of person's goals and values). For example, perception that physically activity lifestyle is part of me |
| Identified regulation | Behavioural regulation when the individual has accepted values and goals of behaviour. For example, perception that I want to be physically active |
| Introjected regulation | Esteem-based pressures regulate behaviour. For example, avoidance of shame or worry about self- and other approval |
| External regulation | External factors regulate behaviour. For example, constraints, fear of punishments or rewards |
| Amotivation | A state in which people lack motivation and intention to behave |

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